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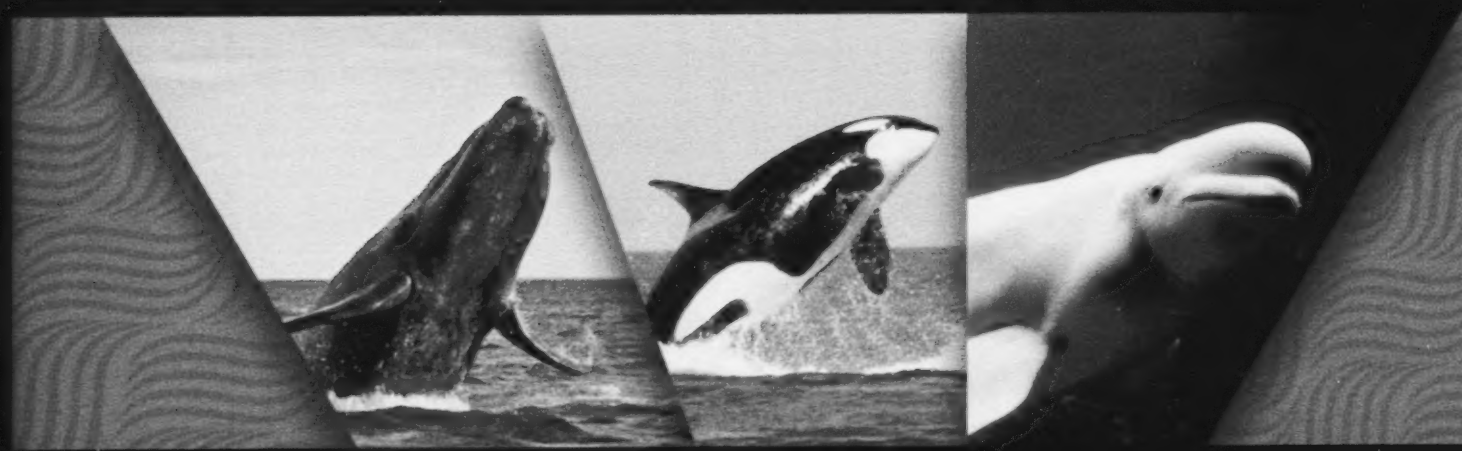
ENGAGEMENT ON THE SCIENCE-BASED WHALE REVIEW

A summary of what was heard



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Canada

Engagement on the Science-based Whale Review
A Summary of What was Heard

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1. Executive Summary

In November 2016, the Government of Canada announced its Oceans Protection Plan, which outlined several new initiatives aimed at addressing threats to populations of marine mammals in Canadian waters. To support this effort, Fisheries and Oceans Canada led a science-based review of the effectiveness of the current management and recovery actions for three at-risk whale populations: the Southern Resident Killer Whale, the North Atlantic Right Whale and the St. Lawrence Estuary Beluga. The Science-Based Whale Review work rolled out in three phases (see Figure 1).

Figure 1. Phases of the Science-Based Whale Review

While Fisheries and Oceans Canada has worked with Indigenous groups, stakeholders and industry for many years to identify recovery actions for these endangered whale populations, this engagement process focused on the timely and efficient implementation of priority management actions. The three key objectives of the engagement were to:

1. Educate parties about the ongoing threats to the three endangered whale populations and the priority management actions identified by scientists to support their recovery.

2. Identify specific actions and clarify roles of those able to reduce negative impacts of human activities on these whales.

3. Confirm the role of different sectors and collaborative approaches to support and implement effective management actions.

This What Was Heard Report on the Science-Based Whale Review includes results for all three endangered whale populations. The feedback the Government of Canada received during the engagement will inform further discussions and implementation planning for enhanced recovery efforts for these whale populations. It summarizes what was heard from:

- 112 groups/organizations and 182 individuals who participated at in person/webinar meetings across the country or made written submissions. These include governments, Indigenous groups and stakeholders (environmental non-governmental and non-profit organizations, industry/business, academia/think tanks, and other).

- 893 individuals from across the country who registered to participate in the online engagement Let's Talk Whales and/or who sent in over 2000 e-mails/letters. Of these individuals between 200 and 300 individuals took the time to complete online questionnaires on specific threats to these whale populations and 160 individuals contributed 193 ideas to an open Ideas Forum.

The report summarizes the common themes that emerged in meetings, written submissions, and the online Let's Talk Whales public engagement. It presents feedback on priority management actions to address five of the threats to one or more of these endangered whale species: prey availability, entanglements, acoustic disturbance and vessel presence, contaminants, and vessel strikes.

Highlights of What Was Heard

Participants felt that the number of whales in each of the three endangered whale populations is critically low. With some exceptions, people who participated in the online Let's Talk Whales public engagement were overwhelmingly positive about the types of actions that scientists identified to enhance whale recovery.

For all three whale populations, governments, Indigenous groups and stakeholders agreed that it is essential to take immediate action to improve recovery efforts and to reduce these five threats. It was suggested that the approach to prioritization and implementation should:

- Integrate *Species At Risk Act*, Oceans Protection Plan and the Science-Based Whale Review processes;
- Give stronger recognition to work done to date by all levels of governments and partners and leverage it to enhance whale recovery;

- Build from the *Species at Risk Act* recovery documents for the three endangered whale populations leveraging regional research, mitigation activities and collaborative partnerships already in place;
- Identify tangible, quantifiable and measureable actions to guide implementation, with clear time lines for each;
- Ensure clear leadership and accountability for moving actions forward;
- Improve coordination and collaboration across implicated federal government departments/agencies, jurisdictions (federal, provincial, municipal) and partners;
- Engage governments, Indigenous groups, stakeholder groups and Canadians in a way that optimizes expertise and mobilizes collective action, including traditional ecological knowledge and technical knowledge of other disciplines, e.g., ecology, marine engineering.

Indigenous participants felt strongly that the process to develop and implement priority management actions should:

- Ensure consultation with Indigenous peoples, both on-reserve and off-reserve, in a clearly defined manner, with commentary encouraged, information provided about the adoption of scientific recommendations by government fisheries management, and financial resources available to support full participation;
- Recognize that Indigenous peoples are actively fishing for food, social and ceremonial purposes, as well as conducting Aboriginal Communal Commercial Fisheries where the three endangered whales frequent;
- Ensure timely and transparent communications with Indigenous communities and fishers to enable partnering to address threats to the endangered whale populations;
- Include Indigenous groups in consultations about the establishment of Marine Protected Areas and exclusion zones that may impact economic viability of Indigenous fisheries.

There were differences in what people viewed as the most critical actions to help recover each of the endangered whale populations. Key differences of opinion centered on the strength of the scientific evidence supporting the proposed actions, which actions should be highest priority, the time lines for implementation and the extent to which existing legislation, regulations, monitoring and enforcement are adequate to support proposed actions.

Prey Availability

- Governments, Indigenous groups and some stakeholders acknowledged that reduced prey availability is an important threat to the Southern Resident Killer Whale and the St. Lawrence Estuary Beluga populations. Prey availability was not mentioned in feedback on the North Atlantic Right Whale.
- In the Pacific region, Indigenous groups, some stakeholders, and participants from the general public overwhelmingly expressed their desire to see protection of the entire habitat of the SRKW's primary prey, (Chinook salmon), including the freshwater as well as the marine portion, from industrial development and pollution without delay to help its survival. Some industry/business participants expressed their willingness to support this approach as a means to ensure responsibility for action is shared amongst those who contribute to the different pressures on salmon habitat.
- Indigenous groups said that priority management actions should look holistically at the issues that impact whale recovery, including the threat posed by industrial development on whale habitat.
    - In the Pacific region, they said that actions should build on local recovery efforts of Southern Gulf Island First Nations to foster healthy and abundant herring/sand lance populations, which are a food source for the SRKW's prey.
    - In engagement sessions in the Québec and Maritime regions, Indigenous groups requested more information on St. Lawrence Estuary Beluga prey stocks (type of prey; foraging areas) and the level of threat to these prey stocks from climate change; they requested that these prey stocks be taken into consideration when identifying and creating a network of Marine Protected Areas, and they suggested a systematic system be set up to collect and analyze prey samples to monitor their level of contamination.
- The majority of participants from the general public favoured fisheries closures for Chinook salmon or at least would support putting strict restrictions in place that are actively monitored and enforced.

Entanglements

- The majority of on-line participants expressed their concern about the threat of entanglements and its impact on the North Atlantic Right Whale. The fishing industry was open to discussion and willing to engage in solving the problem.
- There was some support for introducing fishing restrictions in North Atlantic Right Whale critical habitat to remove fishing gear that can cause entanglements (Grand Manan Basin; Roseway Basin).[1]
- All participants were open to some restrictions on fishing through dynamic closures in other highly used areas of North Atlantic Right Whales. However, participants requested more information and clarification on the concept of dynamic closures (during the fishing season versus on a seasonal basis) and how high use areas will be identified and managed. Fishery closures should target those fisheries known to pose the greatest risk of entanglement for North Atlantic Right Whales.
- Participants stressed that decisions to restrict or close fisheries should be reliant on the availability of accurate, and if possible, real-time data on whale presence; a clear, practical approach to communicating and implementing closures is needed that takes into account the impact on Indigenous communities and the broader fishing industry.
- Funding is needed to strengthen monitoring and research on North Atlantic Right Whale presence, to increase capacity for entanglement response in the Canadian Atlantic and Québec (more people trained to respond; funds for equipment and operations), and to develop awareness campaigns to educate fishers and other marine users about identifying these whales and reporting sightings.
- There was support from most participants for advancing research and testing of gear modifications that decrease the risk of entanglements; Indigenous groups are interested in participating in the testing process.
- Participants from the fishing industry acknowledged that gear marking and new gear reporting systems could be implemented, but the impacts on fishermen should be considered (keeping it simple, maintaining privacy, minimizing time and financial cost).

[1] The Science-based Whale Review and most stakeholder and online engagement happened *before* the North Atlantic Right Whale deaths in the Gulf of St. Lawrence in 2017.

Acoustic Disturbance and Vessel Presence

- There were some divergent views expressed around:
  1. Reducing human interaction with whales to reduce noise or using technological solutions to overcome noise emission problems, e.g., making ships quieter.
  2. Taking immediate action versus taking more time to generate and/or integrate evidence to implement priority management actions that will be effective at achieving objectives, e.g., demonstrated positive impact on whales by lowering noise levels.
- Generalized actions to reduce underwater noise were supported by most participants from the general public, Indigenous groups and some stakeholders, e.g., environmental non-governmental and non-profit organizations, some industry/business representatives. Participants from the general public would like to see reduced activity on the water, supported with enforcement, whether through exclusion zones, noise caps, acoustic refuges, and/or slow down zones.
- Indigenous groups called for more urgent action to protect critical Southern Resident Killer Whale habitat from the impacts of vessel noise and industrial development; for scientific measurement of noise levels to consider multiple vessels in critical habitat at a given point in time, not just single vessel noise levels; and, for the scope of any proposed area-specific vessel regulations to be clarified.
- Online participants who commented on actions aimed at directly abating threats supported changing vessel routes and creating sanctuaries to reduce human interaction with the three endangered whale populations. Some industry/business stakeholders are not convinced that refuges would work and argue that the concept needs to be made operational.
- Many participants from the general public perceive the whale watching industry as a contributor to disturbance of whales and are in favour of stronger industry regulations, monitoring and enforcement. The whale-watching industry believes they are a partner in conservation, as their livelihood depends on a healthy, sustained whale population; they are interested in partnering on education and awareness efforts as well as monitoring and reporting to increase knowledge about whale presence and behaviours.
- Online participants, Indigenous groups and environmental non-governmental organizations frequently mentioned solutions that include Marine Protected Areas or sanctuaries (where vessel traffic is restricted). In written submissions, specific regulatory approaches were put forward to strengthen whale habitat protection, e.g., by amending the Oceans Act (Bill C-55) to create Interim

Marine Protected Areas that can be more quickly introduced and to exclude oil and gas and other harmful activities in Marine Protected Areas.

Vessel Strikes

- Participants from all parties would like to see stronger systems in place for detecting whale presence and communicating this information to vessel operators to avoid vessel collisions and disturbance to whales.
- Indigenous groups and stakeholders requested more information about the type and size of vessels that would be affected by any new restrictions in North Atlantic Right Whale critical habitat or other high use areas, which shipping lanes might be affected, what alternate routes might be proposed, and how high use areas would be identified and managed.
- Indigenous groups and some participants agreed that priority should be placed on removing large vessels from North Atlantic Right Whale critical habitat and suggested applying speed restrictions on large vessels in areas where these whales are known to be present. Some participants felt it would be relatively easy to remove commercial shipping vessels from their critical habitat, e.g., by making minor changes to existing shipping lanes (Grand Manan Basin) and encouraging greater compliance with guidelines (Roseway Basin); participants agreed that any changes need to take into account the impacts on marine safety.
- Transport Canada clarified that the Department does not "remove" vessels but rather manages vessel movement.[2]
- Online participants almost universally supported the general measures proposed in the online questionnaire. They supported introducing stronger regulations, monitoring and enforcement as well as educating and sensitizing the public. When asked about which approach was more important, equal numbers of participants supported both approaches.
- Indigenous groups and some other participants do not believe that actions to reduce vessel strikes (or restricting vessel traffic; reducing vessel speed) will be feasible without regulatory action that is supported by enforcement. Most participants from the general public would like more monitoring and enforcement on the water (more eyes on the water).
- The shipping industry expressed a desire to see definitive evidence of the efficacy of proposed measures before engaging in a conversation, and is more open to voluntary measures.

[2] As per section 136 (1) of the *Canada Shipping Act*, the Governor in Council may, on the recommendation of the Minister of Transport, make regulations regulating or prohibiting the navigation, anchoring, mooring or berthing of vessels for the purposes of promoting the safe and efficient navigation of vessels and protecting the public interest and the environment.

Contaminants

- The Government of British Columbia and representatives from the United States National Oceanic and Atmospheric Administration were interested in coming together to form an interagency working group on contaminants.
- Indigenous groups believe that cumulative effects of resource development should be taken into account in identifying and implementing priority management actions to enhance recovery of the Southern Resident Killer Whale and the St. Lawrence Estuary Beluga.
- In engagement sessions in British Columbia, Indigenous groups suggested making a strong linkage to the integrated resource monitoring and assessment work already underway in the province. Other concerns focused on reducing industrial chemical pollution to improve shellfish and whale habitats; and, enhancing regulations to control polluters who contaminate First Nations' food.
- In engagement sessions in Québec and the Maritimes, Indigenous groups suggested clarifying the specific chemicals that are currently problematic for the St. Lawrence Estuary Beluga and the sources of this contamination; information should be provided about contaminated sites and the status of decontamination efforts; First Nations are interested in collaborating on the decontamination of sites and on raising awareness of pollution impacting St. Lawrence Estuary Beluga habitat.
- Indigenous groups raised concerns about oil spill response and would like to see increased capacity for Indigenous groups, whale watching and fishing vessels to participate in quick response. Public participants who commented online frequently expressed concerns about oil spills and plastic pollution in the ocean. Some expressed a desire to eliminate the risk by stopping or limiting the transportation of oil by vessels; others agree that whale protection should be considered in oil spill response plans.
- Some online participants who commented on actions aimed directly at abating threats agreed that the rate of implementation of Wastewater Systems Effluent Regulations should be accelerated. The Government of British Columbia and municipalities support this approach; under the assumption that resources will be made available to help off-set costs.
- Online participants also believe there is a need for stronger regulations and changes in aquaculture practices that some believe harm human health, whales and their prey, e.g. replacing open-net aquaculture with land-based enclosed farms, better monitoring/controlled use of pesticides, antibiotics, and fish foods at fish farms.
- Participants from all parties are concerned by chronic (continuous, lesser magnitude) spills, e.g., disposal at sea, bilge water, land runoff, oil leaks.

2. Project Background

Phase 1: Scientific Review Process

In Phase 1, Fisheries and Oceans Canada scientists assessed the overall effectiveness of the recovery actions undertaken to date at reducing the key threats to the three endangered whale populations. They also identified areas for immediate improvement in recovery efforts and priorities for new or enhanced efforts, most of which could be initiated within five years.

An assessment of the threats affecting each whale population forms the basis for recovery measures that are identified in recovery strategies and action plans required under the *Species at Risk Act* (2002).[3,4,5] For the Science-Based Whale Review, Fisheries and Oceans Canada scientists also identified priority management actions to abate the key threats to these three whale populations from a scientific perspective only, to help support recovery. These priority management actions, including timing and prioritization, were informed by:

- The recovery measures identified through the established *Species at Risk Act* process, identified in *Species at Risk Act* recovery documents, that have been implemented to date and those that are not yet underway;
- The current state of knowledge regarding the threats affecting the species today and any changes in those threats over time;
- The current population trajectory.

In some cases new actions were identified, while in others, actions already identified in published Recovery Strategies or Action Plans were further refined. For the Southern Resident Killer Whale, a newly emerged threat of vessel strikes was identified. For the detailed methodology, please refer to the complete Phase 1 science assessment reports.

The findings from the Science-Based Whale Review do not replace documents already developed under the *Species at Risk Act*, but are complementary to those

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[3] **Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status Reports.** Southern Resident Killer Whale; St. Lawrence Estuary Beluga; North Atlantic Right Whale.

[4] Recovery Strategy for the Northern and Southern Resident Killer Whales **(Orcinus orca) in Canada (2011);** Recovery Strategy for the Beluga Whale **(Delphinapterus leucas), St. Lawrence Estuary Population in Canada (2012);** Recovery Strategy for the North Atlantic Right Whale **(*Eubalaena glacialis*) in Canadian Waters (2014).**

[5] Action Plan for the North Atlantic Right Whale **(*Eubalaena glacialis*)** in Canada: **Fishery Interactions (2016);** Action Plan for the Northern and Southern Resident Killer Whale **(Orcinus orca) in Canada (2017).**

documents. Results are intended to help focus management efforts, and augment the prioritization of recovery measures in those documents.

The priority management actions identified in Phase 1 have implications for Canadians, all levels of Government, Indigenous groups, industry (both large and small business) and the many non-governmental groups who work to protect the environment.

Phase 2: Engagement Process

Through the engagement process, the Government of Canada sought feedback on the priority management actions and on how governments, Indigenous groups, stakeholders (environmental groups; industry; key partners) and the public can work together on implementation.

The engagement activities took place from June 15 to September 19, 2017. See Section 3 – Summary of Engagement Strategy for details.

The three key objectives of the engagement were to:

1. Educate parties about the ongoing threats to the three endangered whale populations and the priority management actions identified by scientists to support their recovery.

2. Identify specific actions and roles to reduce negative impacts of human activities on these whales.

3. Confirm the role of the different sectors and collaborative approach to support and implement effective management actions.

Phase 3: What Was Heard Report

This 'What Was Heard' report on the Science-Based Whale Review includes results from the engagement process for all three endangered whale populations. The report summarizes what was heard from participants at regional in person/webinar meetings across the country, written submissions (e-mails, letters), and the public through the online portal (Let's Talk Whales).

The feedback the Government of Canada received during the engagement will inform further discussions and implementation planning for enhanced recovery efforts for these whale populations. These efforts could also have benefits for other whale populations in Canada.

3. Summary of Engagement Strategy

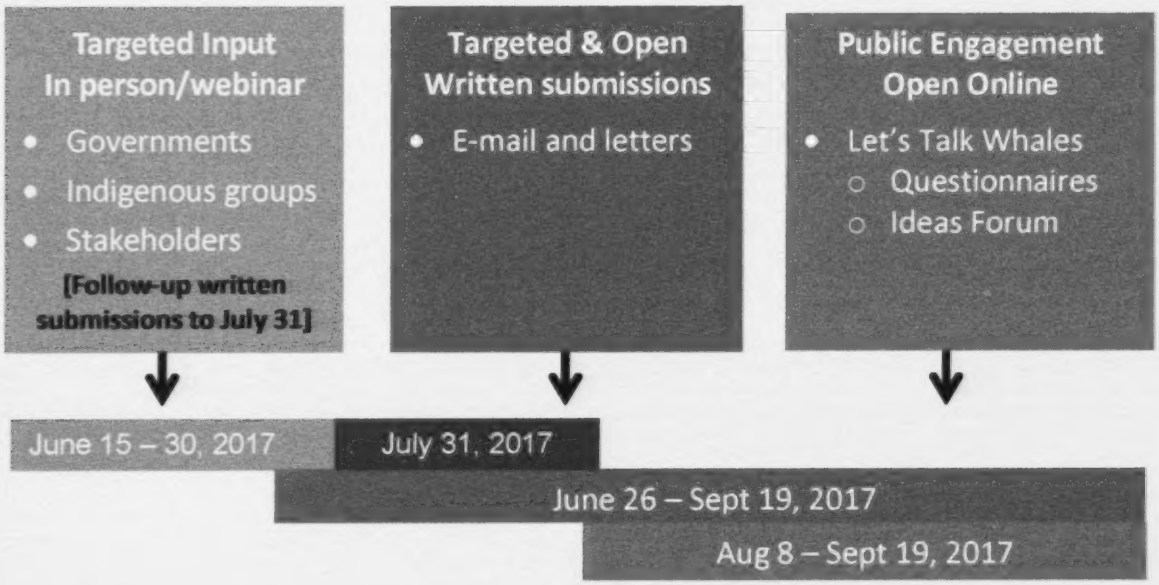
The Science-Based Whale Review was launched as part of the Oceans Protection Plan in recognition of increasing threats to three endangered whale populations. While Fisheries and Oceans Canada has worked with Indigenous groups, stakeholders and industry for many years to identify recovery actions for these populations, the engagement strategy focused on the next step - the timely and efficient implementation of priority actions.

The findings included in this report are from multiple channels based on two main engagement strategies:

- A targeted approach for input from governments, Indigenous groups and stakeholders; and
- An open public engagement approach (online) to reach the Canadian public.[6]

Figure 2 provides a snapshot of the time line engagement components and time line.

Figure 2. Science-Based Whales Review Engagement Components and Time-Line



[6] Unsolicited written submissions from the general public and interested groups (e-mails, letters) were also received outside the online engagement as awareness of the engagement process increased. Comments from these submissions are integrated into the findings from the public engagement.

3.1 Targeted Input

Regional in person/webinar meetings (by invitation) were held and/or written submissions were received from:

- Governments (federal government departments, provincial and municipal governments, U.S. Government);
- Indigenous groups;
- Stakeholders (industry/business, environmental non-government and non-profit organizations and academia/research groups).

The targeted regional engagement sessions were held from June 15 through June 30, 2017. Each meeting (in person and/or webinar) was facilitated by Delaney and Associates or an independent consultant. The sessions focused on priority management actions identified in the Phase 1 science assessment report specific to one of the three endangered whale populations.

The meeting format consisted of an introduction to the purpose of the meeting and a brief presentation on the priority management actions identified in the Phase 1 scientific assessment report for one of the three endangered whale populations. Each meeting included information to help situate the Science-Based Whale Review in the context of other whale and ocean management related efforts such as *Species at Risk Act* processes, and the Oceans Protection Plan, among others. Participants were invited to ask clarifying questions and to provide feedback on priority management actions for one or more of the main threats.

Participants provided feedback through a combination of open discussion and, in the Pacific region, through structured activities, e.g., rating current state of the priority management actions to identify quick wins, ease of implementation, readiness to provide leadership/partner, and opportunities for collaboration.

Transcriptions of discussion were prepared and coded by consultants, in collaboration with Fisheries and Oceans Canada.

In response to the expressed need by stakeholders for additional time to provide comments, Fisheries and Oceans Canada offered the opportunity to provide written feedback following the in person/webinar meetings.

For additional information on in person/webinar meetings and written submissions, see Appendix A – Who We Heard From:

- Appendix A1 – Summary of Participation in Regional Meetings
- Appendix A2.1 -A2.3 – Organizations Represented at Regional Meetings
- Appendix A3 – Organizations Who Made Written Submissions

3.2 Open Public Engagement

Canadians (individuals and groups) provided input through an online portal and by sending e-mails/letters to Fisheries and Oceans Canada.

The online portal (Let's Talk Whales) was open from August 8 to September 19, 2017. Feedback was collected through:

- **Questionnaires:** Five short questionnaires inviting participant feedback on key actions to help support recovery. Each survey focused on one of five key threats affecting one or more of the endangered whale populations:
    - Threat 1: Food availability
    - Threat 2: Underwater noise
    - Threat 3: Entanglements
    - Threat 4: Contaminants
    - Threat 5: Vessels
- **Ideas Forum**: An open-ended forum for Canadians to post their ideas for action and to comment on the ideas of others. The open-ended challenge question posed on the forum was:

    How can we, as Canadians, take action now to reduce impacts on at-risk whales and help their recovery?

3.3 Adapting and Strengthening the Engagement Process

When announced in November 2016, the Oceans Protection Plan committed the Government to deliver the Science-Based Whale Review by summer 2017. The science-based assessment reports were finalized at the end of April 2017 and made available for engagement sessions.

Engagement sessions took place from mid to late June 2017. Participants raised concerns about timing, in particular the proximity to summer holidays, the engagement activities being held during the busy season for the fishing and whale-watching industries, and the short time frame between the materials being available and the sessions taking place. Indigenous groups also raised concerns that financial support did not accompany the engagement request.

The Government of Canada responded to the early feedback on the limited time for review and comment, providing additional time for follow-up written submissions, strengthening communication and outreach to partners and looking into additional mechanisms to engage stakeholders on this issue.

Feedback received through participant evaluations was reviewed by the consultant group and the Government of Canada to inform future engagements.

4. Summary of What We Heard

4.1 Who Did We Hear From?

A total of 117 groups or organizations and 182 individuals participated in the regional in person/webinar meetings. An additional 31 written submissions were received as follow-up to those meetings. See Appendix A for details on Who We Heard From.

A total of 893 individuals registered to participate in the online engagement Let's Talk Whales (for all three endangered whale populations), of which:

- 284 responded to the Food Availability questionnaire;
- 228 people responded to the Entanglements questionnaire;
- 245 responded to the Underwater Noise questionnaire;
- 242 responded to the Vessels questionnaire;
- 209 responded to the Contaminants questionnaire;
- 160 participants contributed a total of 193 ideas in the Ideas Forum.[7]

Most people who provided their feedback online self-identified as general public (see Figure 3). When asked to self-rate how well-informed they were on each of the threats, most people felt they were informed to some degree. Ninety percent of respondents were either actively engaged in the issues (16%), felt well-informed (46%), or that they knew some facts (28%) (see Figure 4).[8]

In addition, close to 2000 written submissions were received from the general public. Most of these submissions (over 85%) were e-mails sent to Fisheries and Oceans Canada as part of environmental non-governmental organization campaigns to increase engagement (Canadian Parks and Wilderness Society, David Suzuki Foundation, and Georgia Straight Alliance). These e-mails were copies of form letters created by the campaigns; in some cases, respondents added their own feedback to the form letter. Environmental non-governmental organizations also posted ideas on the Ideas Forum.

[7] An additional 16,885 people visited the Let's Talk Whales site during the summer engagement, which included background information on the three endangered whale populations to help educate the public, but did not register to participate.

[8] The only exception is for the threat of Food Availability, where fewer respondents felt well-informed about the issue or felt they knew the facts.

Figure 3. Profile of People Who Provided Feedback Online

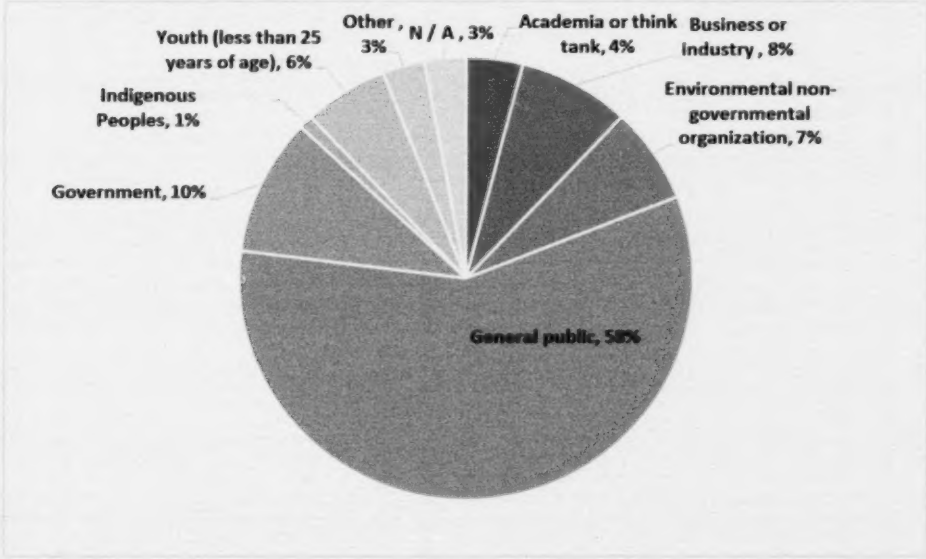
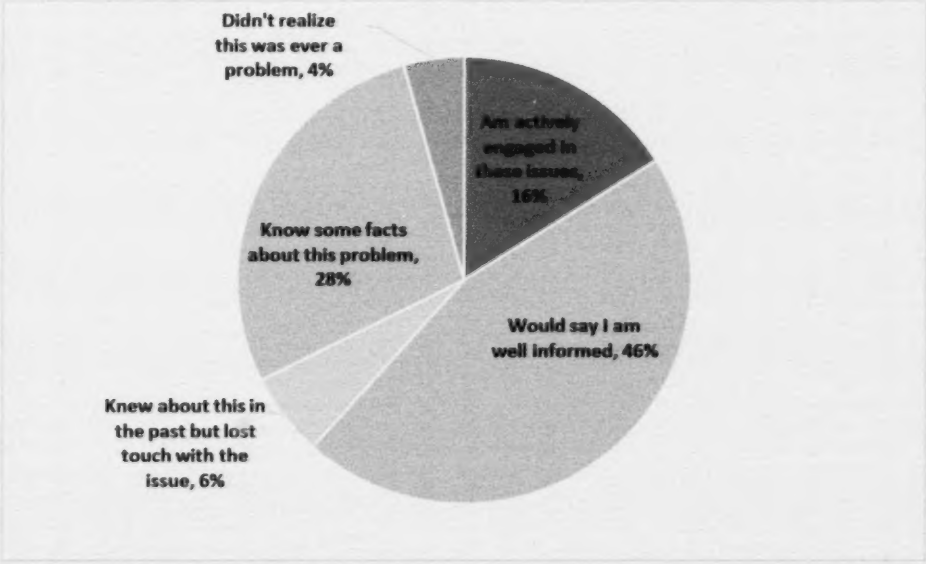


Figure 4. How Well-Informed Did Online Respondents Feel about the Threats to the Endangered Whale Populations (self-rated)[9]


Didn't realize this was ever a problem, 4%
Am actively engaged in these issues, 16%
Know some facts about this problem, 28%
Would say I am well informed, 46%
Knew about this in the past but lost touch with the issue, 6%

[9] For each threat, respondents were asked to self-rate how well informed they felt about the issues; responses were similar across all threats. Figure 4 is an average of responses across all threats.

4.2 Understanding the Findings

The two main components of the engagement strategy were designed as complementary and therefore provide different types of feedback:

- The stakeholder engagement process was designed to hear initial reactions from informed governments, Indigenous groups and stakeholders to the priority management actions identified in the Phase 1 science assessment reports and to explore how to collectively move forward to support and implement effective management actions. The approach was designed to "take the pulse" of participants and did not seek to develop consensus.
- The public engagement process was designed to educate Canadians on the threats to endangered whales, gauge their level of awareness of the issues, invite their thoughts on some of the actions identified by scientists to reduce the threats, and provide a public space for them to share their own ideas for action.

Therefore, results of the Phase 2 engagement process should be viewed as a mosaic of opinions from a range of people, from those with a high level of in-depth expert knowledge on the issues through to people new to the issues who were interested enough to visit the online portal, respond to the surveys and offer their own ideas.

The findings from the engagement of governments, Indigenous groups and stakeholders and the public engagement were analyzed separately, as was the regional or whale-specific feedback. The analysis took into consideration that:

- Stakeholders who participated in regional in person/webinar meetings received the Summary Report of the Phase 1 findings one week in advance. At the session, they heard a presentation that introduced the priority management actions and they had an opportunity to ask clarifying questions. Furthermore, many participants, if not most, had been active in understanding threats to endangered whales, and involved in the *Species at Risk Act* recovery planning process and/or its implementation.
- People who gave their feedback through the online public engagement may or may not have had previous background on the issues and/or read the material available online. They did not have a chance to ask clarifying questions or to reflect on the experience of others, with the exception of the comments posted on the Ideas Forum.

Caution is needed in reviewing the results of the in person/webinar meetings and public online engagement. The online engagement was not designed to yield results that would be representative of the Canadian population. In person/webinar participation generally was impacted by the short timelines and the timing of the engagement session (i.e., over the summer).

4.3 How the Following Sections are Organized

Sections 5 to 9 each focus on one of the major threats to the endangered whale populations identified in Phase 1:

- Prey availability;
- Entanglements;
- Acoustic disturbance and Vessel Presence;
- Vessel Strikes; and
- Contaminants.

Each section includes a brief description of the threat and feedback on priority management actions[10] received from meetings, written submissions, and via the online portal (Let's Talk Whales). Feedback is organized by a summary of key themes (for the whale populations affected by the threat) and by what we heard from Indigenous groups, Government and other stakeholders, and the general public.

Section 10, Conclusions - Feedback on Readiness to Move Forward, presents common themes that apply to all three endangered whale populations and that have implications for the federal government and all regions across Canada.

[10] **The Phase 1 priority management actions for each of the three endangered whale populations (North Atlantic Right Whale, St. Lawrence Estuary Beluga, Southern Resident Killer Whale) are described in the Science-Based Whale Review summary reports.**

5. Prey Availability

Southern Resident Killer Whales are highly specialized predators and forage primarily on Chinook salmon. The survival and recovery of this endangered whale appears to be strongly linked to Chinook salmon abundance. In particular, a sharp decline in Chinook salmon abundance that persisted for four years during the late 1990s was associated with mortality rates up to 2-3 times greater than expected. [11] This lack of prey availability persists today and is one of the key threats to the recovery of the population.

Similarly, the decline of the St. Lawrence Estuary Beluga population in the late 1990s and changes in population dynamics coincided with changes in several environmental conditions, including a decline in the abundance of demersal fish and some pelagic prey[12], suggesting that food supply may have become limited and may still be playing a role in the current decline.

Changes in food supply that affect North Atlantic Right Whales include decreases in food availability (they feed on tiny zooplankton called copepods) and quality (i.e., nutritional value), and some shifts in distribution, including shifts that move their food supply to areas of high overlap with known threats. For example, in summer 2017, North Atlantic Right Whales were seen in record numbers in the Gulf of St. Lawrence, an area where they have not been known to congregate in large numbers.[13]

5.1 Summary of Key Themes

Indigenous groups, governments, and other stakeholders provided feedback on the threat of prey availability for the Southern Resident Killer Whale. Indigenous groups provided feedback on prey availability for the St. Lawrence Estuary Beluga.[14]

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[11] Ford, J.K.B, Wright, B.M., Ellis, G.M., and Candy, J.R. 2010b. Chinook salmon predation by resident killer whales: seasonal and regional selectivity, stock identity of prey, and consumption rates. Fisheries and Oceans Canada. Sci. Advis. Sec. Res. Doc. 2009/101. iv + 43 p.

[12] Plourde, S., Galbraith, P., Lesage, V., Grégoire, F., Bourdage, H., Gosselin, J.-F., McQuinn, I., and Scarratt, M. 2014. Ecosystem perspective on changes and anomalies in the Gulf of St. Lawrence: a context in support to the management of the St. Lawrence beluga whale population. DFO Can. Sci. Advis. Sec., Res. Doc. 2013/129: vi + 27 p. Available at: http://www.dfo-mpo.gc.ca/csas

[13] The science reports and engagement happened prior to this unprecedented event.

[14] One comment was also received from the Québec government, and is noted in the text following the feedback from Indigenous groups, under "What Regional Stakeholders Said".

- Governments, Indigenous groups and some stakeholders acknowledged reduced prey availability as an important threat to the Southern Resident Killer Whale and the St. Lawrence Estuary Beluga populations. Prey availability was not mentioned in feedback on the North Atlantic Right Whale.
- In the Pacific region, Indigenous groups, some stakeholders, and participants from the general public overwhelmingly expressed their desire to see protection of the entire habitat of the SRKW's primary prey, (Chinook salmon), including the freshwater as well as the marine portion, from industrial development and pollution without delay to help its survival. Some industry/business participants expressed their willingness to support this approach as a means to ensure responsibility for action is shared amongst those who contribute to the different pressures on salmon habitat.
- Indigenous groups said that priority management actions should look holistically at the issues that impact whale recovery, including the threat posed by industrial development on whale habitat.
    - In the Pacific region, they said that actions should build on local recovery efforts of Southern Gulf Island First Nations to foster healthy and abundant herring/sand lance populations, which are a food source for the SRKW's prey.
    - In the Québec and Maritime regions, Indigenous groups requested more information on St. Lawrence Estuary Beluga prey stocks (type of prey; foraging areas) and the level of threat to these prey stocks from climate change; they request that these prey stocks be taken into consideration when identifying and creating a network of Marine Protected Areas and they suggest a systematic system be set up to collect and analyze prey samples to monitor their level of contamination.
    - The majority of participants from the general public favoured fisheries closures for Chinook salmon or at least would support putting strict restrictions in place that are actively monitored and enforced.

5.2 What Indigenous Groups Said

Southern Resident Killer Whale

Representatives from Indigenous groups expressed strong concerns about delaying concrete, substantive Southern Resident Killer Whale priority management actions and did not feel that the Science-Based Whale Review consultation process had balanced input from the full range of Indigenous groups and other stakeholders. They expressed that inaction can be expected to threaten the existence of the Southern

Resident Killer Whale and to have a dramatic overall effect on the food chain and Aboriginal rights to fish.

Feedback from Indigenous participants included:

- Ensure that the Science-Based Whale Review and emerging priority management actions look holistically at the issues that impact whale recovery, including the threat posed by industrial development on whale habitat;
- Ensure traditional ecological knowledge[15] is included in setting priorities and implementing priority actions;
- Share up-to-date scientific information with participants on Southern Resident Killer Whale prey selection, current ocean and freshwater management of species and stocks to support informed evaluation of the priority management actions;[16]
- Address the impact of use of drones on the Southern Resident Killer Whale population (not mentioned in the Action Plan or the Science-Based Whale Review);[17]
- Focus efforts on understanding the availability of certain stocks, e.g., Cowichan Chinook;[18] recognize the efforts already underway, the challenges and the complexities of making change;
- Build on local efforts of Southern Gulf Island First Nations to increase the focus of Southern Resident Killer Whale recovery efforts on herring and sand lance populations; specifically, the impacts of commercial herring fisheries in Gulf Islands within their traditional territories;
- Support the efforts of First Nations to build their own hatcheries in their waterways on their traditional territories to help Chinook flourish.

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[15] Fisheries and Oceans Canada representative clarified that although there was no direct traditional ecological knowledge input into the Science-Based Whale Review, traditional ecological knowledge was considered in the development of the Resident Killer Whale Recovery Action Plan, reviewing progress to date on the Action Plan measures and ensuring a strong link to those measures.

[16] Fisheries and Oceans Canada representative indicated that any new science information would not be packaged and shared with participants; however, new information would be presented through existing processes as it becomes available.

[17] Fisheries and Oceans Canada representative noted that use of drones will likely be relevant to all three endangered whale populations.

[18] Fisheries and Oceans Canada note that Cowichan have not been identified as a key prey stock for SRKW.

St. Lawrence Estuary Beluga

In responding to priority management actions identified in the Phase I scientific assessment, participants focused on the actions seeking to improve prey abundance through reduced competition and habitat enhancement.

Suggestions from Indigenous participants included:

- Provide more information about the St. Lawrence Estuary Beluga prey stocks (type of prey; foraging areas);[19]
- Take St. Lawrence Estuary Beluga prey stocks into consideration when identifying and creating a network of marine protected areas; and specifically, to increase protection around Isle aux Lièvres;
- Share current knowledge on the level of threat to St. Lawrence Estuary Beluga prey from climate change;

5.3 What Governments and Other Stakeholders Said

St. Lawrence Estuary Beluga

The Ministère de l'Agriculture, des Pêches et de l'Alimentation du Québec commented that consideration should be given to managing the grey seal population and suggested this approach could reduce competition for St. Lawrence Estuary Beluga prey.

Southern Resident Killer Whale

Plan and manage fisheries to reduce human competition for Southern Resident Killer Whale prey

Some people supported implementing measures to reduce human competition for Southern Resident Killer Whale prey stocks in important foraging areas during key times, e.g., during years of poor Chinook returns. They believe that no further research is required before acting. A specific suggestion was to immediately reduce fishing pressure in already-identified foraging areas, including those areas with depleted Chinook stocks that transit Southern Resident Killer Whale critical habitat.

However, other participants felt that, before taking action, more work needs to be done to:

[19] Indigenous communities on the North Shore do very little fishing of forage species. There is already a moratorium on krill and copepods.

- Communicate actions taken to date to protect the abundance of Chinook stocks and the evidence of impact on Southern Resident Killer Whale;
- Better understand the complexity of the issue of prey availability and how these measures could help whale recovery;
- Clarify the strategic approach to setting targeted fishery restrictions, e.g., guided by current evidence of where along the Canada-US coast Chinook stocks are abundant;
- Include the sport fishery as well as commercial shipping industries in the measures. Sport fisheries often target Chinook and aim to catch the large fish that are part of the whale diet.

Form and formalize a Transboundary[20] Working Group of science and management.

The feasibility of implementing many of the prey-related priority management actions is dependent on transboundary management with the United States and work within the framework of the Pacific Salmon Treaty. There was general support for moving forward transboundary work over the short-term.

Protect and preserve the freshwater habitat of important Southern Resident Killer Whale prey stocks.

Fisheries and Oceans Canada currently relies on existing legislation, e.g., the *Fisheries Act*, to protect local fish stocks and local habitat in the marine environment. With respect to freshwater habitat, the *Fisheries Act* requires that projects avoid causing serious harm to fish unless authorized by the Minister of Fisheries and Oceans Canada. This applies to work being conducted in or near waterbodies that support fish that are part of or that support a commercial, recreational, or Aboriginal fishery (e.g. Chinook Salmon). At the provincial levels, some actions are underway to protect Chinook habitat, such as new provincial groundwater regulations.

Addressing the threats to freshwater habitat was noted as more important than controlling harvest levels (the low hanging fruit) by some meeting participants and in some written submissions.

Suggestions included:

- Take substantial steps at the federal and provincial levels to protect the freshwater habitat of key Chinook stocks;[21]

[20] Within the world of Pacific salmon, "transboundary" and "transboundary working group" refers specifically to stocks originating in North West British Columbia and migrating through South East Alaska.

- Implement and enforce existing regulations to protect freshwater habitat;
- Take into consideration the Pacific Salmon Commission's coast-wide Chinook salmon model in Southern Resident Killer Whale recovery.
- Identify and communicate concrete examples of how Fraser Chinook habitat has been protected to help identify gaps and priorities for action;
- Extend protection and preservation to include both freshwater and nearshore habitats that have been degraded and are of known importance for Chinook and recover the capacity of the Salish Sea to support Chinook;
- Address straying of unmarked hatchery fish to protect the genetic diversity and population productivity of wild salmon;
- Increase enforcement and protection of spawning areas for the forage fish stocks (herring, sand lance) through cooperation of federal, provincial and municipal levels of government.

Implement fisheries management measures to foster healthy and abundant populations of herring and sand lance[22] to support greater availability of Chinook.

Depletions of local populations of forage fish due to harvesting are a concern in the region. This depletion may be contributing to decreased Chinook biomass in the marine environment and, therefore, a reduction in the primary food source for Southern Resident Killer Whales.

Participants at the in person/webinar meetings and those who sent in written submissions supported:

- Enforcement efforts to protect spawning habitat of herring and sand lance;
- Following the management approach in Washington State, which identifies local herring stocks;
- Improving habitat conservation for forage fish;
- In general, developing an improved management system for forage fish.

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[21] For example, make a commitment to habitat protection (demonstrate political will), change the *Fisheries Act* to restore previous protections for fish and fish habitat, address budgetary constraints and federal/provincial jurisdictional issues.

[22] While there is no fishery on sand lance at this time, this proposed management action is still identified as a priority in the event that one develops in the future.

Some participants expressed concerns about:

- The amount of scientific evidence showing specifically that changes in stock health (e.g., stronger herring returns) are having an impact on Chinook stocks, and in turn the Southern Resident Killer Whale population.
- The impact of commercial fisheries on local herring or Chinook populations, particularly those identified in the San Juan Islands.

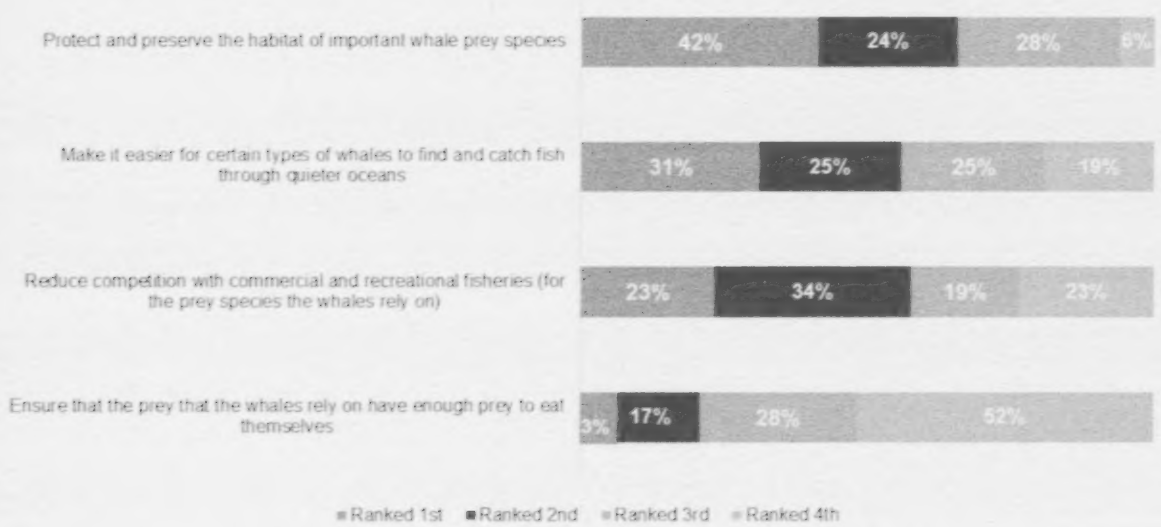
Participant suggestions included:

- Develop and share information on salmon foraging areas that inform harvest control measures;
- Use currently available, existing information and publications to guide management actions;
- Refine fisheries management measures to be more closely linked to different stocks, e.g., Cowichan Chinook.
- Strengthen research, monitoring and data collection.

5.4 What the General Public Said

The main question on the Let's Talk Whales online platform presented a list of four actions identified by scientists to help mitigate the threat of reduced prey availability. Participants were asked to rank the actions according to how important they felt they were to helping the whales (see Figure 5, below).

Figure 5: The General Public's Ranking of Identified Actions to Address the Threat of Reduced Prey (Food) Availability



Of the 265 who responded[23]:

- 42% ranked *protecting and preserving the habitat of important whale prey species* as the most important action, while 24% ranked it second.
- *31%* ranked *making it easier for certain types of whales to find and catch fish through quieter oceans* first, while 25% ranked it second.
- *Reducing competition with commercial and recreational fisheries* followed closely with 23% of respondents considering it number one, and 34% considering it as a second priority.
- A fourth action, *ensuring that the prey that the whales rely on have enough prey to eat themselves,* was viewed by most general public participants as the least important, with only 3% ranking it as the first priority and 17% as second.

[23] This number excludes those who indicated "don't know" as an answer.

6. Entanglements

Entanglement and entrapment of whales in fixed fishing gear, and other types of lines in the water, is a known threat, especially for the North Atlantic Right Whale. Interactions with fishing gear are a major cause of serious injury and death for this population, and an important impediment to recovery. [24] As of 2012, 83% of the North Atlantic Right Whale population was found to have scars indicative of an entanglement in fishing gear at some time in their lives, and the rate of serious entanglement detected has increased significantly over the past 30 years.[25] Linking entanglements to a particular location or gear type in Canada is difficult given the whales are highly mobile and often only ropes remain on an entangled whale; this part of the gear is unmarked and not identifiable.

6. 1 Summary of Key Themes

Indigenous groups, Governments and other stakeholders provided feedback on the threat of entanglements for the North Atlantic Right Whale. This threat was not discussed for the Southern Resident Killer Whale or the St. Lawrence Estuary Beluga.

- The majority of on-line participants expressed their concern about the threat of entanglement and its impact on the North Atlantic Right Whale. The fishing industry was open to discussion and willing to engage in solving the problem.
- There was some support for introducing fishing restrictions in currently identified North Atlantic Right Whale critical habitat to remove fishing gear that can cause entanglements (Grand Manan Basin; Roseway Basin).
- All participants were open to some restrictions on fishing through dynamic closures in other areas that are highly used by North Atlantic Right Whales. However, participants requested more information on the concept of dynamic closures (e.g., during the fishing season versus on a seasonal basis) and how high use areas will be identified and managed. Fishery closures should target those fisheries known to pose the greatest risk of entanglement for North Atlantic Right Whales.

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24 Kraus, S.D., Brown, M.W., Caswell, H., Clark, C.W., Fujiwara, M., Hamilton, P.K., Kenney, R.D., Knowlton, A.R., Landry, S., Mayo, C.A. and McLellan, W.A. 2005. North Atlantic Right Whales in crisis. Science, 309(5734): 561-562.

25 Knowlton, A.R., Robbins, J., Landry, S., McKenna, H.A., Kraus, S.D. and Werner, T. 2015. Effects of fishing rope strength on the severity of large whale entanglements. Conserv. Biol. 30(2): 318-328

- Participants stressed that decisions to restrict or close fisheries should be reliant on the availability of accurate, and if possible, real-time data on whale presence; a clear, practical approach to communicating and implementing closures is needed that takes into account the impact on Indigenous communities and the broader fishing industry.
- Funding is needed to strengthen monitoring and research on North Atlantic Right Whale presence, to increase capacity for entanglement response in the Canadian Atlantic and Québec (more people trained to respond; funds for equipment and operations), and to develop awareness campaigns to educate fishers and other marine users about identifying these whales and reporting sightings.
- There was support from most participants for advancing research and testing of gear modifications that decrease the risk of entanglements; Indigenous groups are interested in participating in the testing process.
- Participants from the fishing industry acknowledged that gear marking and new gear reporting systems could be implemented, but the impacts on fishermen should be considered (keeping it simple, maintaining privacy, minimizing time and financial cost).

6.2 What Indigenous Groups Said

Indigenous groups are supportive of protecting North Atlantic Right Whales but also need to be able to fish to support themselves and their communities. They feel a responsibility to be involved in implementing actions. There is interest in conservation and in increasing community capacity to prevent risks and respond to entanglement events.

Some of the priority management actions that relate to fishing could infringe on Indigenous rights. The Government of Canada must be aware of this and its duty to consult.

Suggestions from Indigenous participants included:

- Consider the continued movement of North Atlantic Right Whales prior to implementing fishery closures to ensure: 1. a measureable benefit to their protection; 2. unnecessary or counterproductive relocation of fishing gear, e.g., where there may be likelihood of North Atlantic Right Whale migration into neighbouring areas where the fishing gear has not been removed;
- Train and adequately resource Indigenous groups to help monitor whale presence, report and respond to entanglements;

- Involve Indigenous groups in testing different fishing gear technologies and innovations, as part of new funding for applied research;
- Consider subsidies to Indigenous community members affected by changes or restrictions on type of gear or lines that would increase costs, particularly where profits are already low;
- Work towards transboundary cooperation with the United States for actions to reduce risk in Canadian waters, specifically in "Grey Zone" jurisdictions; involve First Nations communities along the Canada-United States border in collaborative efforts.
- Use gear marking and gear reporting as an added measure to deter illegal, unreported and unregulated fishing that takes place in Atlantic Canadian waters.

6. 3 What Governments and Other Stakeholders Said

In general, participants at in person/webinar meetings believe that additional capacity and funding is needed to prevent and respond to entanglements. Enhanced or new funding is needed to support Government of Canada activities as well as the activities of external partners.

Participants suggested funding is needed to:

- Strengthen scientific monitoring and research that identifies the presence of North Atlantic Right Whales throughout the year and in broader geographic areas, taking into account the potential for shifting distribution patterns of the North Atlantic Right Whale, e.g., beyond currently identified critical habitats to include new areas where congregations of North Atlantic Right Whales have recently been identified;
- Improve communications and processes for timelier, coordinated action when North Atlantic Right Whales are present in Canadian waters to reduce entanglement risk, e.g., by removing fishing gear through temporary closure of fisheries (in certain areas; at certain times of year);
- Advance research and testing of gear modifications that could reduce risk of entanglements, e.g., in partnership with Indigenous groups, universities and the fishing industry;
- Develop awareness campaigns to educate fishermen and other marine users about identifying whales and reporting all sightings and entanglement events;
- Increase human and financial capacity for entanglement response: more entanglement response teams serving the Canadian Atlantic and Québec; new training opportunities for people to learn whale rescue techniques; funds

to cover the costs of operations, equipment and vessel maintenance, support for whale entanglement response networks;

- Support other levels of government, Indigenous groups and stakeholders to take actions that protect the whale population from entanglement and preserve their habitat, e.g., through enhanced or new funding programs.

Implement temporary fishery closures to remove fishing gear from whale critical habit and high use areas.

For the North Atlantic Right Whale, temporary fishery closures were identified in the science assessment report as a priority management action. Areas of focus for this action are:

1. Currently identified critical habitat in Grand Manan Basin, Roseway Basin;
2. Other identified high use areas

Participants supported the idea of modifying fishing activity in critical habitat. Some participants supported the idea of temporary fishery closures as a way to remove fishing gear from areas where whales are present and could potentially become entangled. For example, support was expressed for the recent step by the Government of Canada to close the snow crab fishery a few days early in an area where a large and sustained concentration of North Atlantic Right Whales were detected and were becoming entangled. Environmental non-governmental organizations have been promoting planned seasonal closures as a management action, rather than active removal of fixed fishing gear during the season in real time when whale presence is detected (i.e., dynamic area management), assuming real time detection is possible.

However, in general, participants felt that more specific information was needed to understand the practicalities of implementing fishery closures and the impact on Indigenous groups, local fishermen, and the fishing industry as a whole.

Participants suggested additional details were needed about:

- Which fisheries are present in the Grand Manan and Roseway Basin critical habitat areas;
- Where other North Atlantic Right Whale high-use areas are located and which fisheries are present there;
- Whether the proposed temporary fishing closures would only be seasonal or if they would be implemented if and when North Atlantic Right Whales were detected in real time in critical habitat or high use areas, after the fishery had already begun ;

- What the trigger or threshold would be for a temporary closure, e.g., number of North Atlantic Right Whales present, length of time they need to be present, as well as the definition of "high use area";
- Who would be responsible for analyzing the North Atlantic Right Whale monitoring data and designating a high use area, and how quickly this would be done to ensure rapid processing of data from the field;
- The level of gear restriction and areas that would be affected, including which types of gear (commercial fixed fishing gear, mobile gear or herring weirs) would need to be removed;
- The potential socioeconomic impact of temporary fishing closures (in certain geographic areas or during different seasonal times).

Suggestions from other participants included:

- Reconsider removing all gear at a given time; is this necessary?;
- Base decisions about gear removal on current information regarding whale presence as well as the types of gear and fisheries that are involved in North Atlantic Right Whale entanglements;
- Provide clear information to the general public, Indigenous groups and others who would be impacted by such closures about why changes to fishing activity are necessary and what the impact would be on fisheries;
- Develop a new conservation strategy that takes into account potential changes in distribution patterns of North Atlantic Right Whales that includes:
    - Better monitoring and surveillance to rapidly detect potential shifts in whale distribution, outside the known traditional high use areas (i.e., southern Gulf of the St. Lawrence) and notification of authorities;
    - More flexible legislative and regulatory tools for the Government of Canada to quickly introduce or lift temporary mitigation measures such as restrictions on fishing or shipping to reduce risk of harm to North Atlantic Right Whales.

Remove rope from the water column by using ropeless gear where North Atlantic Right Whales are present.

Participants were interested in exploring gear modification, but the focus on using ropeless gear was questioned. It was felt that more needs to be done to understand what gear and what type of rope is problematic to whales and what modifications would be feasible, workable, safe and practical.

Participant suggestions included:

- Engage other levels of government, Indigenous groups, fishermen and the fishing industry in finding solutions and implementing gear modifications; fishermen know essential information about gear and area fishing conditions (tide, current and sea bottom types);
- Share information about the current state of new ropeless gear technology and who is currently involved in its development and testing;
- Consider the cost of ropeless gear and evidence that it has a high failure rate and creates ghost gear[26];
- Provide new funding to support research partnerships, pilot testing of new innovations, and promotional activities to adopt the use of new gear types that reduce risk and/or harm from entanglement.

Improve response to North Atlantic Right Whale Entanglements.

Participants agreed that response to North Atlantic Right Whale entanglement events needs to be strengthened in a number of ways.

Participants suggested to:

- Improve monitoring and notification of whale entanglements to facilitate coordinated response;
- Invest in expanded whale response capacity: increase number and expand reach of whale response teams to cover areas where North Atlantic Right Whales have recently been detected in higher numbers; training for new responders; operations, response vessels and equipment;
- Use existing reporting and response processes in the Bay of Fundy as a model that could be replicated elsewhere in the Gulf of St. Lawrence, Québec and Atlantic waters, as it is an example of a model where North Atlantic Right Whale scientists and fishermen work well together to identify and respond to entanglements.

Introduce new gear marking, retrieval and reporting.

New gear marking and gear retrieval programs could help identify the source of gear involved in North Atlantic Right Whale entanglements. Although fishing gear (buoys and balloons) is already marked for ownership, gear marking of the rope components is needed as the gear retrieved is often only rope. Coloured markings could be used to

[26] Ghost gear is any discarded, lost, or abandoned, fishing gear in the marine environment. This gear can continue to entangle and potentially kill marine life, smother habitat, and act as a hazard to navigation.

identify gear used in each type of fishery as well as each type of line (e.g., end lines versus groundlines).

Participants felt that introducing new gear marking and gear reporting requirements could be relatively easy to implement and could help build understanding of the types of gear causing harm to North Atlantic Right Whales. However, they requested more specific information to help them understand actions and their implications.

Specific suggestions included:

- Recognize that fishermen are currently involved in trying to find gear modification solutions that minimize impact to the fishing industry and maximize protection for North Atlantic Right Whales; ensure their ongoing engagement in implementation;
- Consider the cost and time implications of implementing new gear marking and gear reporting requirements for the different fisheries;
- Provide more information about the type of gear marking proposed;
- Clarify the purpose of gear marking and communicate this clearly to fishermen so they understand the intent: to gather data from entangled whales to understand what gear or gear part is problematic for North Atlantic Right Whales and not to assign blame or lay charges against fishermen or the fishing industry;
- Coordinate gear marking schemes in Canada with those already underway in the United States to allow clear identification of source of gear;
- Provide information about existing reporting systems for gear sets of different fisheries and about whether the priority would be applied equally to all fisheries;
- Clarify whether gear reporting would be: for fixed fishing gear[27]; would apply to critical habitat, high use areas or both;
- Include gear location reporting as a modified requirement in logbooks (reporting gear that is set as well as gear that was hauled in), as well as a requirement to report lost gear;
- Ensure that gear reports by fishermen are kept confidential to ensure that prime fishing locations are not made public.

[27] In Canada, fixed gear fisheries are already required to report where they are setting their gear.

6.4 What the General Public Said

The Let's Talk Whales online portal included an open-ended question designed to ask for opinions on the actions identified by scientists in the Phase 1 science assessment to address the threat of entanglement. The list of actions included:

- Modify fishing gear to reduce entanglement risk;
- Remove fishing gear from areas highly used by whales when whales are present; and,
- Have an effective network of responders to disentangle whales.

- Approximately half of the responses directly addressed the above actions. About one third of responses mentioned other actions, with other responses being more general statements not related to particular actions.
- The tone of the comments was overwhelmingly positive towards the actions proposed, with very few comments expressing caution regarding the impact of actions.
- Comments addressing direct actions were relatively balanced among the three actions presented. The action which received the highest response was modifying fishing gear to reduce entanglement risk, followed closely by removing fishing gear from areas highly used by whales, and having a network of responders to disentangle whales.
- Comments related to modifying fishing gear focused on the importance of implementing this action and the need for innovation in fishing gear design. Some comments that supported removing fishing gear from high use areas also identified the need for more enforcement of the action.
- The need for stronger legislation or regulations was a common theme among other actions suggested by those who responded, e.g., larger fines for infractions. This topic was brought forward not only by the general public, but also by some participants self-identified as members of the government, environmental non-governmental organizations and businesses.
- Other responses related to the perceived need to improve the process for identifying and implementing proposed actions. Some participants suggested improving research, modelling and data collection methods to better understand the whales and their habitat. Others highlighted the need to prioritize preventive threat reduction measures.

7. Acoustic Disturbance and Vessel Presence

All whales vocalize and some whales echolocate to communicate and socialize with each other, find food and navigate.

Noise generated by human activities, whether chronic (e.g. shipping noise, ferry operations, whale-watching etc.) or acute (e.g. pile driving, blasting, seismic surveys, military sonar etc.), can interfere with the ability of whales to conduct these essential life processes. The presence of vessels can also affect the behaviour of whales, for example, by causing them to turn their attention away from activities like foraging, feeding, socializing and breeding to avoid the vessel.

Because different types of whales hear and vocalize at different frequencies, underwater noise affects different types of whales in different ways. For example, baleen whales such as the North Atlantic Right Whale hear and vocalize at different frequencies than toothed whales such as the Southern Resident Killer Whale and the St. Lawrence Estuary Beluga. It is estimated that ambient (background) underwater noise levels have increased an average of 15 dB in the past 50 years throughout the world's oceans[28] (a 3dB increase represents a doubling of noise levels).

7.1 Summary of Key Themes

Indigenous groups, governments and other stakeholders provided feedback on the threat of acoustic disturbance for all three endangered whale populations: the North Atlantic Right Whale, the St. Lawrence Estuary Beluga and the Southern Resident Killer Whale. Comments related to the threat of vessel presence were provided for the Southern Resident Killer Whale and the St. Lawrence Estuary Beluga.

- There were some divergent views expressed around:
    1. Reducing human interaction with whales to reduce noise or using technological solutions to overcome noise emission problems, e.g., making ships quieter.
    2. Taking immediate action versus taking more time to generate and/or integrate evidence to implement priority management actions that will be effective at achieving objectives, e.g., demonstrated positive impact on whales by lowering noise levels.
    3. Introducing priority management actions that are voluntary (incentive programs) versus mandatory (legislation, regulation, monitoring and enforcement).

[28] NRC (National Research Council). 2003. Ocean Noise and Marine Mammals. National Research Council, National Academies Press, Washington, D.C.

- Some stakeholders, including the shipping industry, felt that incentive programs could be effective to reduce vessel acoustic footprints and easier to implement.
- Other participants felt that while priority could be given to immediate voluntary actions, stronger regulations, monitoring and enforcement will be needed. Government should increase and sufficiently resource on-the-water enforcement to reduce harassment and disturbance of whales by vessels and to ensure compliance.

- Generalized actions to reduce acoustic disturbance were supported by most participants from the general public, Indigenous groups and some stakeholders, e.g., environmental non-governmental and non-profit organizations. Participants from the general public would like to see reduced activity on the water, supported with enforcement, whether through exclusion zones, noise caps, acoustic refuges, and/or slow down zones.
- Indigenous groups called for more urgent action to protect critical habitat from the impacts of vessel noise and industrial development; for scientific measurement of noise levels to consider multiple vessels in critical habitat at a given point in time, not just single vessel noise levels; and, for the scope of any proposed area-specific vessel regulations to be clarified.
- Online participants who commented on actions aimed at directly abating threats supported changing vessel routes and creating sanctuaries to reduce human interaction with the whale populations. Some industry/business stakeholders were not convinced that refuges would work and argued that the concept needs to be made operational.
- Industry stakeholders expressed strong concern that they were not included among the technical experts who informed the science assessment or as observers in the process to identify the priority management actions. As a result, they questioned the validity of the findings and called for adaptations to the process towards a more fulsome, multi-stakeholder analysis within a formal framework, taking into account the marine safety and economic impacts of priority management actions.
- Indigenous groups and other stakeholders provided specific feedback on the priority management actions, and also shared concerns about the engagement process;

Participants noted that the issue of underwater noise is not as straightforward as removing vessels or reducing vessel speed; for example:

- Noise from vessels varies by type of vessel, oceanographic conditions and bottom topography;

- Reducing vessel speed may prolong the length of time that vessels are in the area where whales are present.

Feedback on specific priority management actions for this threat should be read with this context in mind. Many of the priority management actions are region-specific; however, the following comments consistently emerged for all three endangered whale populations with respect to acoustic disturbance.

Reduce vessel traffic in key areas or implement new vessel-specific regulations, guidelines or incentive programs to decrease acoustic disturbance.

Suggestions included:

- Focus initially on actions that target vessels that make the greatest noise contribution in key areas of whale habitat;
- Ensure actions to reduce acoustic threats result in a reduction in noise levels and noise exposure to the three endangered whale populations;
- Adopt noise reduction targets that are ecologically relevant and can be used as the basis to assess effectiveness of noise reduction measures;
- Provide scientific evidence supporting priority management actions aimed at decreasing acoustic disturbance in or near whale habitat;
- Include the International Maritime Organization 2014 guidelines on vessel noise reduction in the Science-Based Whale Review;
- Take into consideration economic, operational, marine safety, and jurisdictional realities;
- Undertake deeper, highly coordinated engagement with other levels of government, Indigenous groups, the maritime industry and other key stakeholders to realize these actions in the most practicable way;
- Use existing structures to develop and put in place new incentives to reduce vessel noise, e.g., Green Marine;

Industry/business stakeholders stressed the importance of taking actions that balance economic activities with the protection of marine mammals and their habitat.

Increase the minimum distance between the three endangered whale populations (individuals or groups) and pleasure crafts and whale-watching vessels.

Few whale-watching industry representatives were present at the in person/webinar meetings focused on acoustic disturbance due to it being 'high season' for their work. A written submission from tourism industry provided some supplemental feedback from the whale-watching industry.

Suggestions included:

- It was emphasized by representatives who remained after the break at the Québec meeting on the noise threat that some elements of the proposed priority actions could be initiated quickly.
- Discussions should be continued with existing tables such as the Marine Transportation and Marine Mammal Protection Working Group and parallel actions and duplication should be limited.
- Engage people working in the whale-watching industry in refining and implementing actions that impact them;
- Increase the distance between whales and pleasure craft and whale watch vessels (as per the priority management action identified);
- Ensure measures to reduce acoustic disturbance address the significant contribution of whale-watching vessels (some research suggests that up to 1/3 of lost foraging time is attributed to these vessels)[29], in addition to the significant contribution from large commercial shipping vessels;
- Involve the whale-watching industry as partners in conservation, as their livelihood depends on a healthy, sustained whale population; they are interested in partnering on education and awareness efforts as well as monitoring and reporting to increase knowledge about whale presence and behaviours.

Identify and create acoustic refuge areas within foraging and other key areas of habitat of the endangered whale populations.

Suggestions included:

- Establish acoustic refuge areas (designated geographic areas; seasonal areas) that provide a refuge for each of the three whale populations from vessel noise and disturbance (as per the priority management action identified);
- Link to the marine spatial planning process under the *Oceans Act;*
- Prohibit all seismic oil and gas development activities in marine protected areas;
- Ensure the refuge areas apply to recreational and whale watching vessels, as well as commercial vessels.

[29] **See** https://www.portvancouver.com/wp-content/uploads/2017/01/2017-07-ECHO-Program-Estimating-the-effects-of-noise-from-commercial-vessels-and-whale-watch-boats-on-SRKW.pdf

In addition to the concept of acoustic refuge areas, there was support from some participants for the creation of a network of Marine Protected Areas (see Figure 6).

Figure 6. Specific Feedback on Marine Protected Areas

Many participants felt that the creation of Marine Protected Areas could greatly enhance the recovery of all three endangered whale populations. Protected areas can include nursery habitat, migratory corridors, feeding areas, as well as the habitats of whale prey.

Marine Protected Areas are intended to manage all human activities within the area and to address all of the threats at the same time, giving whales a safe and quiet place to live, e.g., protecting whales and their prey from contaminants, providing refuge from threats of underwater noise, vessel strikes, and harmful impacts of a range of activities (entanglements from fishing gear, whale watching vessels and pleasure crafts, oil and gas activities).

Suggestions included:

- Finish management plans and regulations for proposed Marine Protected Areas and create new Marine Protected Areas that coincide with critical whale habitat, especially the Southern Strait of Georgia National Marine Conservation Area in British Columbia, the St. Lawrence Estuary in Québec, the Gulf of the St. Lawrence, the Bay of Fundy and the Laurentian Channel in Newfoundland.
- Implement Marine Protected Area network planning across Canada.
- Use Marine Protected Areas as a regulatory tool to limit shipping and industrial fishing to reduce known threats to endangered whale populations, e.g., to establish no-go zones for ships in critical areas or at critical times and set vessel speed limits to reduce the risk of lethal strikes.
- Amend the Oceans Act (Bill C-55) to create Interim Marine Protected Areas that can be more quickly introduced, and to prohibit oil and gas and other harmful activities in Marine Protected Areas; currently these activities are still permitted in Marine Protected Areas.
- Ensure clear, comprehensive Marine Protected Area rules and management plans are in place and well-enforced.

7.2 What Indigenous Groups Said

Suggestions from Indigenous participants included:

- Take more urgent action to protect critical habitat for the three endangered whale populations from the impacts of vessel noise and industrial development;
- Consider the cumulative effects of increased vessel traffic on the three endangered whale populations and ensure that scientific measurement of noise levels considers multiple vessels in critical habitat at a given point in time, not just single vessel noise levels;
- Clarify the scope of possible removal or restrictions of vessels, area-specific regulations and/or guidelines included in priority management actions;
- Address underwater noise generated by seismic studies conducted by the oil and gas industry in critical habitats, as well as sonar from military vessels.

7.3 What Governments and Other Stakeholders Said

North Atlantic Right Whale

Remove vessels and/or restrict fishing activities in critical habitats or high use areas to decrease the level of noise and the threat of acoustic disturbance.[30]

For the North Atlantic Right Whale, removal of vessels and restrictions on fishing activities are identified priority management actions to reduce the threat of entanglements and vessel strikes (see Section 6 and 8). These actions would also decrease the level of vessel noise in proposed areas.

While it is generally agreed that noise can be harmful, participants discussed the limited scientific evidence on the impact of underwater noise on North Atlantic Right Whales. There is a study which showed a decrease of stress hormones in North Atlantic Right Whales in the aftermath of the September 11, 2001 terrorist attacks when aerial/vessel traffic was stopped.[31] In general, baseline noise levels and acceptable levels are not well understood. It is not yet known to what extent removing noise completely from specific areas will make a difference for North Atlantic Right Whale population recovery.

[30] Transport Canada clarifies that the Department does not "remove" vessels but rather manages vessel movement. As per section 136 (1) of the *Canada Shipping Act*, the Governor in Council may, on the recommendation of the Minister of Transport, make regulations regulating or prohibiting the navigation, anchoring, mooring or berthing of vessels for the purposes of promoting the safe and efficient navigation of vessels and protecting the public interest and the environment.

[31] See https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3350670/

Participants held differing views on whether:

- Sufficient scientific evidence is available to justify removal of vessels to reduce acoustic disturbance to North Atlantic Right Whales;
- Vessel traffic should be completely removed from North Atlantic Right Whale critical habitat or high use areas immediately as opposed to a more gradual approach;
- Fishing activities should be modified in North Atlantic Right Whale critical habitat and/or high use areas.

Suggestions included:

- Clarify the specific areas and/or times of year during which vessel traffic would be prohibited or restricted and whether all vessel types would be equally affected;
- Provide information on existing noise levels associated with fishing activities in North Atlantic Right Whale habitat (noise emitted from different types of fishing activity and vessels);
- Take steps to encourage fisheries to turn off noise-generating devices in sensitive areas where North Atlantic Right Whales are present;
- Develop actions to reduce seismic and sonar noise in North Atlantic Right Whale critical habitats;
- Consider how actions to decrease acoustic disturbance link to feedback on priority management actions to reduce the threats of vessel collision, vessel presence and entanglement, e.g. suggestions to improve monitoring and notification of North Atlantic Right Whale location, capacity for regulation and enforcement.

St. Lawrence Estuary Beluga

For the St. Lawrence Estuary Beluga, the Phase 1 science assessment report identified a number of specific priority management actions to reduce acoustic disturbance generated by human activity. The discussion focused on actions concerning safe approach distances to whales, modifying vessel routes, and creating acoustic refuges.

Suggestions included:

- Take into account the industry feedback already provided to the Government of Canada on the economic, practical and operational impacts of priority management options (as part of consultations in 2016 and 2017 to develop an

Action Plan to reduce the impact of noise on the beluga whale and other marine mammals at risk in the St. Lawrence Estuary);[32]

- Work within existing structures and agreements with the province of Québec's Ministry of Transportation to build on the work of established multi-stakeholder groups aimed at reducing the threats of underwater noise and vessel strikes to the St. Lawrence Estuary Beluga;
- Provide more details on the management action that was identified in the science assessment report to move shipping lanes and the pilot station that are currently in areas important to the St. Lawrence Estuary Beluga; reducing vessel speed could be a practical alternative to moving shipping lanes;
- Identify possible acoustic refuge areas for the St. Lawrence Estuary Beluga (as per the priority management action identified); clarify the types of activities to be permitted in these areas and take steps to create them; in general, the area of the St. Lawrence Estuary that is important to belugas is between l'Isle-aux-Coudres and Rimouski and the scientific literature has identified 28 "hot spots" that are high use areas of the beluga population;
- Rather than restricting all vessel traffic in the entire St. Lawrence Estuary, minimize the impact on fishermen by banning just certain types of vessel engines in acoustic refuge areas.;
- Involve environmental non-governmental organizations in acoustic monitoring in marine protected areas;
- Create exclusion zones where whale-watching vessels are not permitted in Parc Marin Saguenay St. Laurent;
- Strengthen the enforcement of whale-watching regulations for Parc Marin Saguenay St. Laurent and for marine mammals outside the boundaries of the marine park, particularly in the middle of the St. Lawrence Estuary;
- Promote the use of sailboats as whale-watching vessels to reduce noise levels;
- Clarify the purpose of seasonal bans on dredging (e.g., to reduce noise? to prevent the release of contaminated sediments?) and the relative contribution of noise from dredging compared to vessel traffic;
- Consider the impacts of climate change on the St. Lawrence Estuary Beluga habitat and identify actions to mitigate impact;
- Support research that investigates why the St. Lawrence Estuary Beluga seems to be abandoning the Manicouagan estuary.

[32] As part of *Species At Risk Act* consultations.

Southern Resident Killer Whale

For the Southern Resident Killer Whale, the Phase 1 science assessment report identified a number of specific priority management actions to reduce the threat of acoustic disturbance.

Implement area-specific vessel regulations, guidelines or incentive programs to reduce the overall acoustic impact on Southern Resident Killer Whales in or near their habitat, particularly in the Salish Sea.

Participants considered implementing area-specific vessel regulations and/or guidelines that reduce noise in the Salish Sea to be a long-term undertaking.

Suggestions included:

- Provide more information and clarity on actions already underway to reduce noise disturbance in British Columbia coastal waters, particularly the Salish Sea, and reasons why some actions are not yet underway;[33]
- Consider delaying decisions on the Government of Canada's vessel noise reduction implementation plans to late Spring or early summer 2018 to allow integration of key studies, such as the Vancouver Fraser Port Authority ECHO program Vessel Slow Down Research Trial aimed at reducing the noise exposure from commercial vessels;
- Engage with governments, Indigenous groups and industry stakeholders, including ECHO members, to identify where and how government can leverage expertise, capacity and work to date; and to provide input into a collaborative implementation work plan.

Establish a Canada-US transboundary committee aimed at reducing shipping noise in the Salish Sea.

Participants at the multi-stakeholder meeting identified establishing a transboundary committee as a quick win but also viewed it more as a process recommendation rather than a direct action.

Suggestions included:

- Improve integration of the United States National Oceanic and Atmospheric Administration and Fisheries and Oceans Canada on whale science;
- Build or enhance the limited trans-boundary activities already underway aimed at reducing underwater noise.

[32]Example given of the proposed action from the full Phase 1 science assessment: "Assess cumulative effects of potential anthropogenic impacts on Resident Killer Whales using an appropriate impact assessment framework for aquatic species"...

Other proposed actions

- Improve and utilize existing hydrophone networks, e.g., Salish Sea Hydrophone Network, to quantify ocean noise budget through Southern Resident Killer Whale range and to improve reporting of acoustic disturbance incidents.
- Reduce vessel sonar (sounder) noise; for example, ask vessels in the vicinity of whales and in easy-to-navigate waters to shut their sounders off;
- Address acute noise from pile driving, assuming that this type of activity will increase with expanded port activities.

7.4 What the General Public Said

The Let's Talk Whales online portal included an open-ended question designed to ask for opinions on the actions identified by scientists in the Phase 1 science assessment to address the threat of underwater noise. There was a list of specific actions included in the question as examples:

- Increase the minimum distance that is allowed between vessels and whales;
- Modify vessels so that they emit less noise;
- Change how and where vessel traffic moves (e.g. routes; speed); and,
- Create areas in important whale habitat where noise disturbance is restricted or excluded (sanctuaries).

Given the open-ended approach a wide range of responses were received. Nonetheless, two-thirds of all responses directly addressed the list of actions.

- The tone of the comments was overwhelmingly positive, with most expressing their support for the actions, and very few comments (4% of all respondents) expressing caution or dissatisfaction.
- Among the responses directly addressing actions, most (69%) were related to modifying vessels so that they emit less noise. Although the majority of comments were general, some were more specific and included references to the implementation of modern technology to deal with the issue and the need to offer incentive programs.
- Approximately one-third of the comments directly addressed the actions that were related to changing the routes of vessel traffic. [34]Some participants note

[34] The general public may not have an appreciation for the complexity and safety issues surrounding placement of shipping lanes.

the need for guidelines for route-changing and included comments that directly reference oil tankers.

- Another action that generated a notable number of comments (27%) was the proposed creation of sanctuaries. Most of the comments were general and highlighted the public's broad agreement with the action. Nonetheless, this action was also the one that generated the most caution or negative reaction, although this was limited to only 10 comments.
- Among the less positive reactions were concerns expressed by a participant identified with the tourism industry who felt that the benefits of creating whale sanctuaries have not been sufficiently proven. Others point out difficulties in developing recovery efforts due to unpredictable whale behaviour, i.e., changing patterns of travel.
- Aside from the actions presented in the question, participants also included other actions that they think are important. Among these, the main themes that emerged are related to regulations, monitoring, and enforcement. These were mentioned mostly by the general public, but the theme was also prevalent among self-identified government participants, primarily from the federal government.
- Most of the comments related to regulations highlight the need for stronger penalties, developing guidelines, and licensing for the whale-watching industry.
- Some participants noted that regulations are already in place and felt that better monitoring and enforcement is what is really needed.
- Another emerging action proposed, not only by the general public, but also common among environmental non-governmental organizations, is to address the perceived impacts of acoustic disturbance events such as seismic activity associated with mining and drilling projects or sonar activity from the military.

8. Vessel Strikes

Strikes from vessels, whether they are commercial or recreational, can injure or kill whales. Collisions with vessels are a threat to St. Lawrence Estuary Belugas and North Atlantic Right Whales and have recently emerged as a threat for Southern Resident Killer Whales.

The mechanisms by which whales can detect and prevent being struck by a vessel are not completely understood. For North Atlantic Right Whales, risk analyses focused on vessel speed suggest that the probability of lethal injury from vessel collisions decreases when vessel speed is reduced, e.g., reducing vessel speed to less than 13 knots increases the likelihood that a whale struck by a vessel will avoid serious injury or death.[35,36]

8.1 Summary of Key Themes

Indigenous groups, governments and other stakeholders provided feedback on the threat of vessel strikes for the North Atlantic Right Whale.

- Participants at sessions for all three endangered whale populations noted that some actions to reduce underwater noise could also reduce the risk of vessel strikes, e.g., restricting vessel traffic at certain times, moving shipping lanes, or introducing speed restrictions in critical habitat or high use areas. They believe that actions to address the threat of vessel strikes are required to enhance whale recovery.
- Some participants suggested that speed restrictions could be easier to implement than actions involving changes in shipping lanes. Other participants pointed to recent examples of successful changes to shipping lanes in whale critical habitat through collaborative work at the International Maritime Organization, with provincial governments, Indigenous groups and industry, e.g., in the Grand Manan basin.
- Participants from all parties would like to see stronger systems in place for detecting whale presence and communicating this information to vessels to avoid vessel collisions and disturbance to whales.

[35] Knowlton AR, Brown MW (2007) Running the gauntlet: North Atlantic Right Whales and vessel strikes. In: Kraus SD, Rolland RM (eds) The urban whale: North Atlantic Right Whales at the crossroads. Harvard University Press, Cambridge, MA

[36] See http://www.phys.ocean.dal.ca/~taggart/Publications/Vanderlaan_Taggart_MarMamSci-23_2007.pdf

- Indigenous groups and stakeholders requested more information about the type and size of vessels that would be affected by any new restrictions in North Atlantic Right Whale critical habitat or high use areas, which shipping lanes might be affected, what alternate routes might be proposed, and how high use areas would be identified and managed.
- Indigenous groups and some participants suggested that a priority be placed on removing large vessels from North Atlantic Right Whale critical habitat and applying speed restrictions on large vessels in areas where these whales are known to be present (as per the priority management action identified);. Some participants felt it would be relatively easy to remove commercial shipping vessels from their critical habitat, e.g., by making minor changes to existing shipping lanes (Grand Manan Basin) and encouraging greater compliance with guidelines (Rosewater Basin); participants agreed that any changes need to take into account the impacts on marine safety.
- Online participants almost universally supported the general measures proposed in the online questionnaire. They supported introducing stronger regulations, monitoring and enforcement as well as educating and sensitizing the public; when asked about which approach was more important, equal numbers of participants supported both approaches.
- Indigenous groups and some other participants do not believe that actions to reduce vessel strikes (removing or restricting vessel traffic; reducing vessel speed) will be feasible without regulatory action that is supported by enforcement. Most participants from the general public would like more monitoring and enforcement on the water (more eyes on the water).
- The shipping industry wants to see definitive evidence of the efficacy of proposed measures before engaging in a conversation, and are more open to voluntary measures.
- Online participants, Indigenous groups and environmental non-governmental organizations frequently mentioned solutions that include Marine Protected Areas or sanctuaries (where vessel traffic is restricted). In written submissions, specific regulatory approaches were put forward to strengthen whale habitat protection, e.g., by amending the Oceans Act (Bill C-55) to create Interim Marine Protected Areas that can be more quickly introduced and to exclude oil and gas exploration/extraction and other harmful activities in Marine Protected Areas.
- Many participants from the general public perceive the whale watching industry as a contributor to disturbance of whales and are in favour of stronger industry regulations, monitoring and enforcement. The whale-watching industry believes they are a partner in conservation, as their livelihood depends on a healthy, sustained whale population; they are interested in partnering on education and

awareness efforts as well as monitoring and reporting to increase knowledge about whale presence and behaviours.

8.2 What Indigenous Groups Said

In general, Indigenous participants supported the approach of removing vessel traffic from areas where North Atlantic Right Whales are present and/or restricting vessel speed in those areas.

Indigenous participants felt that:

- Vessel traffic rerouting would likely be more difficult than changing shipping speeds;
- Changing vessel routing could take time and could potentially be complex given the economic interests involved (shipping, oil and gas, commercial fishing);
- Actions to reduce threats from vessel strikes (removing vessels; restricting vessel speed) will likely not be feasible without regulatory action that is supported by enforcement.

Suggestions from Indigenous participants were:

- Place a priority on removing or restricting large vessels from North Atlantic Right Whale critical habitat areas (as per the priority management action identified);
- As a preliminary step, apply speed restrictions to large vessels in areas where North Atlantic Right Whales are known to be present (as per the priority management action identified);
- Develop a protocol for dynamic notification of vessel operators when a North Atlantic Right Whale aggregation has been located, e.g., through a survey:
    - The protocol would alert vessel operators as soon as possible of North Atlantic Right Whale presence;
    - Pre-determined guidance could be prepared on how vessel operators should proceed with their transit, taking operational constraints into consideration.
- Explore alternative technologies to reduce the level of shipping impact on North Atlantic Right Whales;

- Coordinate efforts of Fisheries and Oceans Canada and Transport Canada to reduce the threats to the North Atlantic Right Whale and provide more opportunities for Indigenous groups to engage with Transport Canada on these actions in the future.

8.3 What Governments and Other Stakeholders Said

North Atlantic Right Whale

Remove vessel traffic from North Atlantic Right Whale critical habitat and high use areas.

Some participants felt it would be relatively easy to reduce or eliminate commercial shipping vessels in North Atlantic Right Whale critical habitat by relocating shipping lanes (e.g., Grand Manan basin) and encouraging greater compliance with guidelines (e.g., Roseway basin). Removal of commercial shipping vessels away from North Atlantic Right Whale critical habitat in Grand Manan Basin and Roseway Basin is mostly accomplished. However, reducing the numbers of other vessels could be more difficult (e.g., whale watching for Grand Manan Basin, fishing, fisheries enforcement, military, and pleasure vessels for both critical habitat areas).

Participants requested that more specific information be provided about the potential effectiveness of the priority management actions and the expected operational, marine safety and economic impacts on the shipping industry.

Participant suggestions included:

- Clarify what is meant by vessel traffic, specifying:
  - The type and size of vessels included in the restrictions (e.g., fishing vessels, whale-watching vessels, commercial shipping vessels, cruise ships, passenger ferries, all vessels);
  - The shipping lanes that could be affected and, if shipping lanes were moved, the proposed alternate routes;
- Base decisions on the type of vessel to be included in the vessel restrictions on level of risk of vessel strike to North Atlantic Right Whales; for example, risk is expected to be lower for slower-moving vessels such as some passenger ferries;
- Consider operational and navigational marine safety constraints in next steps towards implementation of vessel restrictions in critical habitat or other high use areas;
- Engage Indigenous groups, environmental non-governmental organizations, the shipping industry and other vessel operators, building on and

strengthening the collaborative work with government over the past 20 years to reduce threats from shipping on whales in Canadian waters;

- Based on the results of engagement and further analysis, develop proposals to take to the International Maritime Organization to:
    - Amend commercial shipping lanes in the Grand Manan Basin critical habitat;
    - Amend current Areas to Be Avoided by vessels in the Roseway Basin critical habitat from recommended to mandatory;
- In collaboration with partners, increase communication with vessel operators (commercial ships, fishing, enforcement, and military vessels) transiting the Areas to be Avoided in the Roseway Basin critical habitat to increase compliance with current recommendations;
- Explain how current data gaps on the potentially shifting habitat use and distribution of North Atlantic Right Whales will be filled and how high use areas will be determined;
- Identify potential high use areas that are under consideration for vessel removal on a visual chart, e.g., areas in the Gaspé region of the Gulf of the St. Lawrence;
- In developing specific actions to implement, draw from what is already known to have worked in Canadian and United States waters to reduce vessel strikes;
- Develop more flexible legislative and regulatory tools for the Government of Canada to quickly introduce or lift temporary mitigation measures such as restrictions on fishing or shipping to reduce risk of harm to North Atlantic Right Whales.

Some participants said that the Government of Canada needs new management tools to allow faster, more responsive action to the changing movements of North Atlantic Right Whales. To be effective, government needs the ability to react quickly. Participants made a similar suggestion with respect to the threat of entanglement.

Implement vessel speed restrictions in areas where North Atlantic Right Whales are present.

As with actions aimed at removing or reducing vessel traffic, participants requested more specific information about the implementation of vessel speed restrictions in areas where North Atlantic Right Whales are present.

Participant suggestions included:

- Clarify the nature of the speed restrictions being considered, including the speed being considered, the vessel classes to be affected, the timing of the

restrictions and whether areas outside the boundaries of North Atlantic Right Whale critical habitat would be included; and if yes, how these areas would be determined.

- Share information on the operational and navigational marine safety constraints for the shipping industry and other vessels affected by speed restrictions.
- Apply speed restrictions to large vessels in areas where North Atlantic Right Whales are known to be present (as per the priority management action identified).[37]

Increase awareness and monitoring of vessel traffic restrictions in North Atlantic Right Whale critical habitat.

Participants held different views about whether voluntary measures would be sufficient to remove vessel traffic or if new regulations would be needed:

- Participants from industry indicated a strong willingness to help increase compliance with current voluntary measures.
- Other participants, including Indigenous groups, felt that it would be difficult to achieve a high level of compliance in the busy Grand Manan Basin through voluntary measures.[38] They suggested that regulatory action would be required, supported by enforcement measures that involve several federal departments and international bodies. Transport Canada, has an important role to play as regulator.

[37] This reiterates a priority management action that was identified in the science assessment reports and is not a novel suggestion.

[38] Vanderlaan ASM, Taggart CT, Serdynska AR, Kenney RD, Brown MW (2008). Reducing the risk of lethal encounters: vessels and right whales in the Bay of Fundy and on the Scotian Shelf. Endangered Species Res **4:283-297.** https://doi.org/10.3354/esr00083

8.4 What the General Public Said

The Let's Talk Whales online portal included an open-ended question designed to capture general thoughts on some of the actions identified by scientists in the Phase 1 science assessment to address the threat of vessel strikes. The actions included for this particular threat were:

- Educate vessel operators on collision risks;
- Change how and where vessel traffic moves (e.g. routes; speed);
- Create areas in important whale habitat where vessel presence is restricted or excluded (sanctuaries); and,
- Increase the minimum distance that is allowed between vessels and whales.

- Roughly half (52%) of the responses directly addressed the actions presented. Consistent with all online questionnaires included in this engagement, the overall tone of the comments received was positive, with most expressing their support for the actions. Only one participant from the general public directly expressed rejection for actions related to increasing minimum distances, decreasing speeds, and creating sanctuaries.
- The proposed action that generated relatively more comments was changing how and where vessel traffic moves, of which most of the comments related to establishing route-change guidelines for vessels. Some participants suggested removing all shipping lanes from whale habitats and some called for reducing oil tanker vessel traffic overall.
- Of those comments that directly addressed the actions, a notable percentage (44%), were related to the creation of sanctuaries. Most of the comments were broad, expressing their agreement and support for this action, highlighting the need to protect and restore whale habitat.
- Consistent with what was heard from the public through the acoustic disturbance questionnaire, additional actions emerged related to regulations, monitoring, and enforcement to deal with the threat of physical disturbance. These suggested actions were put forward by multiple groups of the public, including environmental non-governmental organizations and respondents from governments.
- The common theme around regulations, monitoring, and enforcement was the need for stricter regulations, together with increased and improved monitoring, patrolling and enforcement.
- An additional action that generated a notable number of mentions is the need to leverage and implement technological improvements already available that will help address this threat. Most of the comments within this action focused on

improvements in modelling and data collection, as well as implementing a notification system of whale presence to alert and inform marine users of whale presence.

- Only a handful of responses to the open-ended question (4 in total) included comments expressing disapproval and dissatisfaction with the suggested actions.

9. Contaminants

Marine mammals can be exposed to a variety of toxic chemical compounds originating from human activities, mainly through their diet, but also through sediments, water and air in their environment.

Southern Resident Killer Whales are vulnerable to accumulating high concentrations of certain chemicals because they are long-lived apex predators that feed almost exclusively on Chinook salmon.[39] [40]

St. Lawrence Estuary Belugas have a varied diet and eat many kinds of fish and even some shellfish. They live downstream of the many large urban and industrial centers of the Great Lakes Basin year-round exposing them to a variety of contaminants.[41]

North Atlantic Right Whales feed at a lower level on the food chain than the Southern Resident Killer Whale and the St. Lawrence Estuary Beluga on tiny zooplankton called copepods, making them relatively less vulnerable to accumulating high concentrations of chemicals.

9.1 Summary of Key Themes

Indigenous groups, governments and other stakeholders provided feedback on the threat of contaminants primarily for the Southern Resident Killer Whale. Indigenous groups provided feedback for the St. Lawrence Estuary Beluga.

- The Government of British Columbia and representatives from the United States National Oceanic and Atmospheric Administration were interested in coming together to form an interagency working group on contaminants.
- Indigenous groups believe that cumulative effects of resource development should be taken into account in identifying and implementing priority management actions to enhance recovery of the Southern Resident Killer Whale and the St. Lawrence Estuary Beluga.

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[39] Unlike other salmon, many Chinook populations remain in nearshore waters during the ocean phase of their life cycle. As a result, they are more vulnerable to pollution through prolonged exposure and generally accumulate higher concentrations of persistent toxins than other Pacific salmon species.

[40] Mongillo, T. M., G. M. Ylitalo, L. D. Rhodes, S. M. O'Neill, D. P. Noren, and M. B. Hanson. 2016. Exposure to a mixture of toxic chemicals: Implications for the health of endangered Southern Resident killer whales. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-135, 107 p. doi:10.7289/V5/TM-NWFSC-135

[41] Some pollutants have existed for a long time in their environment, and have been regulated well before concerns were raised about their potential health effects. Other chemical compounds assessed as toxic were introduced in the environment more recently (e.g., polybrominated diphenyl ethers) and were only regulated after 2005. Other emerging and currently unregulated contaminants remain unquantified in beluga tissues given the currently limited research efforts on contaminants and belugas.

- In engagement sessions in British Columbia, Indigenous groups suggested making a strong linkage to the integrated resource monitoring and assessment work already underway in the province. Other concerns focused on reducing industrial chemical pollution to improve shellfish and whale habitats; and, enhancing regulations to control polluters who contaminate First Nations' food.
- In engagement sessions in Québec and Maritimes, Indigenous groups suggested clarifying the specific chemicals that are currently problematic for the St. Lawrence Estuary Beluga and the sources of this contamination; information should be provided about contaminated sites and the status of decontamination efforts; First Nations are interested in collaborating on the decontamination of sites and on raising awareness of pollution impacting St. Lawrence Estuary Beluga habitat.
- Indigenous groups raised concerns about oil spill response and would like to see increased capacity for Indigenous groups, whale watching and fishing vessels to participate in rapid response efforts.
- Public participants who commented online frequently expressed concerns about oil spills and plastic pollution in the ocean. Some expressed a desire to eliminate the risk by stopping or limiting the transportation of oil by vessels; others agree that whale protection should be considered in oil spill response plans.
- Some online participants who commented on actions aimed directly at abating threats agreed that the rate of implementation of Wastewater Systems Effluent Regulations should be accelerated. The Government of British Columbia and municipalities support this approach; under the assumption that resources will be made available to help off-set costs.
- Online participants also believe there is a need for stronger regulations and changes in aquaculture practices that some believe harm human health, whales and their prey, e.g., replacing open-net aquaculture with land-based enclosed farms, better monitoring/controlled use of pesticides, antibiotics, and fish foods at fish farms.
- Participants from all parties are concerned by chronic (continuous, lesser magnitude) spills, e.g., disposal at sea, bilge water, land runoff, oil leaks.

9.2 What Indigenous Groups Said

With respect to the priority management actions for addressing contaminants, participants suggested:

- Taking into account cumulative effects of resource development on the marine environment in the approach to Southern Resident Killer Whale recovery;
- Making a strong link between the Oceans Protection Plan and the Cumulative Effects integrated resource monitoring and assessment work underway in British Columbia;[42]
- Restoring marine ecotoxicology and contaminants expertise at Fisheries and Oceans Canada;
- Re-thinking expectations of First Nations' participation in oil spill response given: a) extremely rough conditions in the Salish Sea in the spring and fall (the most likely time for a spill); and b) currently available equipment;
- Reducing industrial chemical pollution to improve habitats for shellfish and the Southern Resident Killer Whale population;
- Enhancing regulations to control polluters who contaminate the food that First Nations eat;[43]
- Organizing the collection and analysis of St. Lawrence Estuary Beluga prey samples to monitor their level of contamination.

With respect to engagement of Indigenous groups, participants' suggestions included:

- Ensure consultation with all affected First Nations[44], including smaller communities with limited administrative, technical and fiscal capacity to attend meetings or feedback.[45]

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[42] See Cumulative Effects Framework of British Columbia http://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/cumulative-effects-framework

[43] The Environment and Climate Change Canada representative noted that a number of chemicals affecting the Southern Resident Killer Whale are "legacy contaminants". They are persistent and organic so they bioaccumulate in the fish. While certain contaminants are no longer being introduced to the environment, they can persist for a long time.

[44] Coastal First Nations communities as well as those up the Fraser River with known interest in harvesting Chinook salmon.

[45] In response to expressed concerns about the level of consultation conducted to inform the development of the Action Plan, Fisheries and Oceans Canada provided a verbal overview of the opportunities for engagement that were offered. A post-meeting follow-up included provision of the concerned participant with a full summary of the

- Develop a cohesive horizontal approach across Fisheries and Oceans Canada, Environment and Climate Change Canada, Transport Canada and Natural Resources Canada with clear, harmonized mandates.[46]

St. Lawrence Estuary Beluga

There is some information of the evolution of contaminants affecting the St. Lawrence Estuary Beluga over time. Some toxic chemicals were banned many years ago, but persist in the marine environment and are still found in St. Lawrence Estuary Belugas. Contaminants are known to interfere with St. Lawrence Estuary Beluga reproduction.

The discussion focused on actions to raise awareness of the sources of contaminants, reduce discharges in beluga habitat, clean up wastewater effluents, and develop oil spill response capacity.

Indigenous participant suggestions included:

- Clarify the specific chemicals that are problematic for the St. Lawrence Estuary Beluga and sources of contamination;
- Provide more information about contaminated sites affecting the St. Lawrence Estuary Beluga and the status of decontamination;
- Collaborate with First Nations on the decontamination of sites and on raising awareness of pollution impacting St. Lawrence Estuary Beluga habitat;
- Provide financial assistance to coastal villages without water treatment systems who live in proximity to St. Lawrence Estuary Beluga habitat;
- Consult with First Nations about the establishment of marine protected areas and exclusion zones that may impact economic viability of Indigenous fishers;[47]
- Develop a rapid response system for oil spills, particularly between Québec and Sept-Iles where the strong currents demand immediate action;
- Form oil spill response teams that include whale-watching and fishing vessels and improve support to the Marine Mammal Response Network.

Department's engagement with First Nations, stakeholders and the public at large from the period from November 2010 to August 2016.

[46] Noted that each department currently has its own mandate and approach to consultation with stakeholders. It is a huge challenge to achieve positive outcomes for Southern Resident Killer Whale recovery. It is an even greater challenge to achieve this through a Nation to Nation approach when there is not a coherent mandate or coordinated approach.

[47] Marine Protected Areas and exclusion zones can help mitigate against pollution incidents in important areas for the whales (see Figure 6 for more details).

9.3 What Governments and Other Stakeholders Said

As a necessary first step to move priority management actions forward to reduce the threat of contaminants, it will be necessary to re-establish or re-invigorate structures and processes and to clarify roles and responsibilities for contaminants in marine mammals. At this time:

- Fisheries and Oceans Canada has greatly reduced contaminants capacity due to previous programmatic changes and budget reductions.
- Environment and Climate Change Canada and Health Canada regulate contaminants to protect the environment and human health and consider available information that is not typically specific to the effects on marine mammals.[48]

Southern Resident Killer Whale

Adequately enforce existing, and/or newly added or expanded, Canadian regulations aimed at reducing toxic chemical compound discharges at source.

This priority action was among those rated as quick wins by participants at the in person/webinar meeting.

Specific suggestions related to regulation and enforcement included:

- Improve enforcement of Canadian regulations to reduce toxic chemical discharges at source and strengthen those laws to reduce point and non-point source discharge (e.g. provide federal support to regional governments to help with enforcement) ;
- Introduce better monitoring and enforcement measures to prevent vessel discharge of bilge water.[49] Currently, the Canadian Coast Guard regulates and monitors discharge at sea;
- Take immediate action to ban identified contaminants rather than conducting new research;

[48] Specifically, when assessing whether the chemical is capable of causing harm to the Canadian environment, Environment and Climate Change Canada considers all available ecotoxicity data to identify the most sensitive organisms. Most ecotoxicity data are generated for small freshwater species, as freshwaters are typically the most impacted environmental media. Risk management measures focus on addressing the most significant releases to the environment. This does not preclude the marine environment; however, most available data is for freshwater environments.[49] Note: Ballast water is regulated by Transport Canada with enforcement by the Canadian Coast Guard.

[49] Note: Ballast water is regulated by Transport Canada with enforcement by the Canadian Coast Guard.
http://laws-lois.justice.gc.ca/eng/regulations/SOR-2011-237/page-1.html
https://www.tc.gc.ca/eng/marinesafety/oep-environment-sources-ballastwater-1722.htm

- Re-invigorate connections and programs that have faded over time, e.g. regarding disposal at sea, and ensure roles and responsibilities of compliance branch are understood;
- Review agency mandates for enforcement to ensure sufficient protection is provided to endangered populations such as the Southern Resident Killer Whale.
- Maintain coastal monitoring stations over the long term to finalize the list of contaminants in the marine environment that pose a threat to Southern Resident Killer Whales;
- Consider impact on ocean wildlife, especially species at risk when approving and removing chemicals from use;
- Introduce cradle to grave management of chemicals;

Participants also discussed the need for clearer roles and responsibilities for the protection of marine mammals from contaminants. They suggested this could begin with a comprehensive stakeholder and situational mapping process to improve understanding of current roles and respective agency enforcement and prioritization processes for chemicals.

Accelerate the rate of compliance with the Canadian Wastewater Systems Effluent Regulations (2012) in wastewater treatment facilities that border the Salish Sea.

The upgrade schedule for facilities that border the Salish Sea is financially constrained and an accelerated rate of compliance with the Canadian Wastewater Systems Effluent Regulations would require additional financial resources, e.g., assistance from the federal government (Infrastructure Canada) or other funding sources.

Participant suggestions included:

- Shorten time lines for upgrades to secondary treatment (or encourage voluntary compliance in shorter time lines) and include appropriate funding from all levels of government.
- Provide federal funding support to accelerate action at the regional or municipal level to upgrade their wastewater treatment systems.
- Provide a list of wastewater facilities in the lower mainland and on Vancouver Island to the public along with their risk ranking (and thus timing for compliance).[50]

[50] The list of wastewater systems issued transitional authorizations under the *Wastewater Systems Effluent Regulations*, including the deadlines to upgrade, is available at: https://www.canada.ca/en/environment-climate-change/services/wastewater/regulations/registry-transitional-authorizations.html.

- Include managers of wastewater systems in planning and discussion to increase awareness of new contaminants.

Review policies and best management practices for ocean dredging and disposal at sea and modify them to include an examination of Polybrominated Diphenyl Ethers[51] to minimize contaminant exposure.

This priority management action was rated as a quick win by participants at the in person/webinar meeting.

Participant suggestions included:

- Expand monitoring criteria for disposal at sea to include other chemicals (polychlorinated biphenyls, polybrominated diphenyl ethers, dioxins and furans);
- Improve information management and communications regarding these policies and best practices (within department, within government, more broadly to First Nations and international governments);
- Look at the United States cross-agency approach.[52] Their management program includes several federal agencies.
- Create a regional ocean disposal advisory committee to feed policy direction in this area;
- Reinvigorate existing scientific monitoring and research activities (e.g., literature review) to help move forward policies and practices, taking into account polybrominated diphenyl ethers.

Identify or implement new programs that mitigate small scale and/or chronic contaminant spills and leaks and provide support.

Generally, small spills are addressed by provincial and municipal levels of government. However, little is known about where and how programs exist to address this issue sufficiently. Further, the mandate of regional government pertains primarily to health and recreational impacts or effects.

Participant suggestions included:

- Share best practices across jurisdictions, e.g., Capital Regional District model storm water management bylaw;

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[51] Polybrominated diphenyl ethers are organobromine compounds that are used as flame retardant. These chemicals are used in a wide array of products, including building materials, electronics, furnishings, motor vehicles, airplanes, plastics, polyurethane foams, and textiles.

[52] For example, sediment testing, water testing in Puget Sound, testing of dredged materials.

- Determine how provincial and regional levels of government currently address small spills;
- Provide federal funding to regional or municipal governments to act on the environmental effects of contaminant loading from storm water;
- Determine the extent of impact of storm water on the Southern Resident Killer Whale population;
- Focus local actions on small spills at marine pleasure craft fuelling stations and waste-water tank discharge and bilge emptying in harbours and identify the lead(s) e.g., marinas, Canadian Coast Guard;
- Increase the presence of provincial or regional government representatives at future meetings to learn more about current policy and practices addressing small scale and/or chronic contaminant spills and leaks.

Ensure that assessment and remediation plans for contaminated sites are planned to reduce the risk of lifetime contaminant exposure in the whale population.

This priority action was among those rated as quick wins by participants at the in person/webinar meeting where there is fulsome data and analysis.

Participant suggestions included:

- Conduct a mapping exercise to identify locations of contaminated sites and overlay important whale/prey habitat to inform remediation;
- Ensure future interagency coordination takes into consideration both federal and provincial contaminated sites;
- Raise awareness of this priority management action with all federal departments managing federal contaminated sites on the coast; and help to assemble best available knowledge (guidance) in coordination with the Government of British Columbia.

Develop a spill response plan including training, equipment, and deterrence methods and ensure that the protection of the Southern Resident Killer Whale population and their habitat is made a high priority in spill response and monitoring protocols in Canada.

Current initiatives are underway to help prevent, respond to and mitigate the impact of oil spills on the Southern Resident Killer Whale population. Participants were not clear on the federal government's role in the context of emergency response planning relative to other partners.

Suggestions included:

- Environment and Climate Change Canada and Fisheries and Oceans Canada could initiate further discussion with other departments and partners such as Transport Canada, Canadian Coast Guard and Western Canada Marine Response Corporation to increase understanding of respective roles in emergency response planning;
- Regularly monitor industry to ensure compliance with regulations requiring spill reporting (beyond current industry self-regulation);
- Strengthen spill response plans, the coordination of incoming calls about an oil spill event, and communication with the shipping industry about spill response involving whales (multiple issues and specific measures are identified in detailed meeting notes);
- Ensure the protocols and response measures address the unique requirements of small spills or on-going leaks as well as large catastrophic oil spills;
- Use real-time detection to identify the location of Southern Resident Killer Whales in relation to oil spill response areas and share this information with involved agencies;
- Make the Western Canada Marine Response Corporation area response plans publicly available and test with stakeholders; develop plans for areas not yet covered in current plans;
- Continue to support collaborations with industry and other stakeholders to develop enhanced spill response measures;
- Strengthen enforcement of polluter pay principle, but expand to ensure the polluter is fully liable for damage compensation for environmental, fiscal and/or social impacts;
- Do not develop or expand fossil fuel projects or increase tanker traffic within the critical habitat of the Southern Resident Killer Whale population.

Form an interagency contaminants working group to identify roles and responsibilities for actions to reduce the impacts of contaminants on Southern Resident Killer Whales and their environment.

Given many of the priority actions are outside the current mandate or jurisdiction of Fisheries and Oceans Canada, it was recognized that there is high value in forming a new interagency contaminants working group. The objectives of this working group should include: increasing capacity for action on contaminants and improving communication and facilitating collaborative action.

Provincial and United States government participants were interested in the interagency working group approach and discussed how best to establish the group.

9.4 What the General Public Said

The Let's Talk Whales online portal included an open-ended question designed to ask for opinions on the actions identified by scientists in the Phase 1 science assessment that aimed at abating the threat of contaminants. The actions presented within the question were:

- Reduce the amount and number of contaminants entering whale habitat;
- Raise awareness about what contaminants are harming whales and where they come from;
- Cleanup sites that are already contaminated, on land and in water;
- Take whales into account in chemical spill response and monitoring; and,
- Clean up wastewater effluent.

- Most of the comments directly addressed the above actions. All of these comments had a positive tone, expressing general agreement and support for the actions.
- The action that generated the most reactions was to reduce the amount and number of contaminants entering whale habitat. Given that the action presented is broad in scope, most of the comments were also broad. Common themes included general statements related to the need to reduce water pollution and toxic contamination produced by dumping of waste. Some participants were more specific and suggested banning toxic substances (13% of all respondents), reducing manufacturing of plastic products (10%) and increasing fines for pollution (10%).
- Raising awareness about what contaminants are harming whales and where they come from also generated a notable number of reactions (33% of all comments directly address an action). Some participants suggested incentivizing recycling initiatives.
- The need to clean up contaminated sites was put forward in notable numbers as well (20% of all comments directly addressing an action). A common theme was the need to protect and restore the ecological balance.
- As with the previous questionnaires that included open-ended approaches, participants suggested other actions not presented in the question. Most of these additional actions were related to regulations, monitoring, and enforcement, e.g. of agricultural run-off, of effluent from aquaculture (particularly Atlantic salmon fish farms).
- Additional actions related to regulations were brought forward by multiple groups, including the general public, environmental non-governmental

organizations, and academia. The common theme was the need for stronger regulations and changes in aquaculture practices that some believe can harm human health, whale health and/or their prey,[53] e.g. replacing open-net aquaculture with land-based enclosed farms, better monitoring and control of use of pesticides, antibiotics, and fish foods at fish farms.

- Enforcement was an action proposed mostly by the general public; this highlights the general perception that there is a need for more policing and monitoring, including disposal of contaminants and effluent.
- A notable number of comments included suggestions related to process improvements. Common themes related to this topic included the need for ensuring the measures are tested before being applied; ensure proper prioritization of actions; and statements emphasizing the importance of government collaboration and integration in addressing the issues impacting whales.
- Although there were no negative reactions directly related to the proposed actions, some participants (2% of all contaminants questionnaire respondents) took the opportunity to express their dissatisfaction with the way the government has approached protecting the whales, citing in some cases the perception that there is lack of political will to enact change.

[53] Participants noted the increased risk of disease to wild salmon stocks linked to fish farming and the potential harm from farmed fish escaping the pens.

10. Conclusions - Readiness to Move Actions Forward

Without exception, all who provided input said they were committed to collaborating with the Government of Canada and others to advance recovery of the three endangered whale populations. This includes those who had expressed frustration during the summer engagement process.[54]

10.1 Common Themes across All Threats

Participants agreed it is essential to take prompt action to improve recovery efforts for the three endangered whale populations and to mitigate the threats of reduced prey availability, entanglements, acoustic disturbance and vessel presence, vessel strikes, and contaminants.

Everyone who provided input at in person/webinar meetings said that governments should work with and support collaborative, multi-stakeholder initiatives that involve governments, Indigenous groups, industry, scientists and other stakeholders. Where possible, future engagement or consultations should be stream-lined and tap into these existing collaborations.

Suggestions for setting priorities and implementing actions included:

- Integrate *Species at Risk Act*, Oceans Protection Plan and the Science-Based Whale Review processes;
- Give stronger recognition to work done to date by all levels of government and non-government actors, and leverage it to enhance whale recovery;
- Build on existing/in progress *Species at Risk Act* recovery documents, leveraging regional research, mitigation activities and collaborative partnerships already in place;
- Identify tangible, quantifiable and measurable actions to guide implementation, with clear time lines for each;
- Ensure clear leadership and accountability for moving actions forward;
- Improve coordination and collaboration across implicated federal government departments/agencies, jurisdictions (federal, provincial, municipal) and partners;
- Engage governments, Indigenous groups, stakeholder groups and Canadians in a way that optimizes expertise and mobilizes collective action, including:
    - The application of traditional ecological knowledge;

[54] Based on comments expressed in follow-up communications.

- The technical knowledge of other disciplines, e.g., ecology, marine transportation engineering, etc.

Indigenous participants felt strongly that the process to develop and implement priority management actions should:

- Ensure consultation with Indigenous peoples, both on-reserve and off-reserve, in a clearly defined manner, with commentary encouraged, information provided about the adoption of scientific recommendations by government fisheries management, and financial resources available to support full participation;
- Recognize that Indigenous peoples are actively fishing for food, social, and ceremonial purposes, as well as conducting Aboriginal Communal Commercial Fisheries where the three endangered whale populations frequent;
- Ensure timely and transparent communications with Indigenous communities and fishers to enable partnering to address threats to the endangered whale populations.

Differing Opinions:

There were differences in what people viewed as the most critical actions to help recovery of the three endangered whale populations. Key differences centered on the strength of the scientific evidence supporting the proposed actions, which actions should be highest priority, the timelines for implementation, and the extent to which existing legislation, regulations, monitoring and enforcement are adequate to support proposed actions.

Some participants felt that current evidence, along with the urgency to act, provided a clear enough path to guide immediate action, without delay.

- The message of urgency was strongest from Indigenous groups and environmental non-governmental organizations who participated in meetings and many participants from the general public who provided input through the Let's Talk Whales online engagement.
- Although all who held this view supported a less-rushed and more engaged process, they believed it crucial to move beyond planning to immediate action based on the currently available evidence.
- Delay is not seen as an option given the known threats and the small number of whales in each of the three endangered whale populations. Where there are gaps in evidence, the precautionary principle is suggested to prevent irreversible damage to the population.

Other participants felt that more definitive scientific evidence, e.g., impacts of acoustic disturbance on whales, and further analysis and deeper engagement of all parties is

needed to better inform moving forward with some priority management actions, particularly regulatory approaches.

- The message of "take time" to gather more scientific evidence was strongest from groups representing industry/business and centered on the importance of taking actions that would be effective at achieving objectives.
- People expressed concern about using a prioritization process based solely on scientific evidence, without consideration of the impact of actions on safety, operations, and economic viability (e.g., commercial shipping, tourism,[55] marine transportation).
- People also questioned the validity of some conclusions of the Phase 1 science assessment reports and requested an opportunity to review the supporting scientific evidence. A small proportion of people who responded through the online public engagement shared similar views.

Another difference of opinion centered on the approach to regulation, monitoring, and enforcement.

- Some industry/business groups are already taking voluntary action. Some participants suggested that existing legislative and regulatory frameworks are adequate and preferred the approach of working together through existing collaborative processes.
- However, others felt that voluntary measures were not sufficient and that governments could: 1. do more to enforce existing regulations that support whale recovery; 2. allocate additional resources to support stronger monitoring and enforcement; and/or 3. strengthen legislation or regulations to improve protection.

10.2 Roles and Leadership

The nature of the engagement process did not lend itself to the clear identification of roles in implementation or identification of leads for specific priority management actions. However, there was a clear expectation that the Government of Canada would:

- Have a strong leadership role in convening and collaborating with all levels of government, Indigenous groups, and stakeholders to develop priorities for action and regional implementation plans;
- Build on current efforts and recovery measures already identified, underway, and in development;

[55] Whale watching and pleasure boating were specifically noted.

- Use a robust framework to guide engagement of all parties in legislative, regulatory and policy measures within federal jurisdiction to support recovery actions for the three endangered whale populations;
- Strengthen and formalize United States-Canada transboundary collaboration and cooperation to address shared concerns: across the Fisheries and Oceans Canada and United States National Oceanic and Atmospheric Administration; and more broadly, to include additional groups and governments.
- Collaborate with provincial and municipal levels of government to address actions in areas of shared jurisdiction.

10.3 Improved Coordination and Communication

There was a strong message to increase coordination and communication to leverage efforts, avoid duplication and stream-line engagement and consultation processes:

- Across federal departments (Fisheries and Oceans Canada, Environment and Climate Change Canada, Health Canada, Natural Resources Canada, Transport Canada,);
- Across jurisdictional levels;
- Between governments, Indigenous groups, industry, and other stakeholders involved or impacted by recovery efforts for the three endangered whale populations.

Specific suggested mechanisms included:

- Develop a more cohesive horizontal approach across Fisheries and Oceans Canada, Environment and Climate Change Canada, Health Canada, Natural Resources Canada and Transport Canada with clear, harmonized mandates;
- Create new structured mechanisms for information sharing and communication across departments, agencies, and organizations or groups involved in moving forward priority management actions addressing the threat areas;
- Have all involved government departments present when priority management actions are reviewed and prioritized; and
- Centralize available scientific and technical information pertinent to each of the threat areas (specific mention for information related to underwater noise).

10.4 Future Engagement and Consultation

There was no single preferred format of engagement among participants, with in person and webinar both identified among the preferred options. Similarly, some indicated a preference for working through existing tables while others did not.

Participants identified a range of others who should be at those tables moving forward on priority management actions to enhance recovery for each of the three endangered whale populations, including:

- Technical experts in marine safety and navigation;
- Whale-watching industry representatives; and
- The Canadian Coast Guard.

And they indicated a strong interest in engagement to advance the identification, planning and implementation of Marine Protected Areas.

Where possible, federal departments should work with and support existing collaborative, multi-stakeholder initiatives that involve governments, Indigenous groups, industry, scientists and other stakeholders, tapping into these established networks and partnerships for future engagement and consultations. Regional stakeholders/groups should be involved in planning the engagement approach to ensure strong linkages with existing networks/partnerships and feasible timelines and logistics for all involved.

Indigenous participants requested that future engagement/consultation:

- Use a more cohesive and coordinated approach across Ministries that looks at cumulative effects and the whale ecosystem rather than a narrow approach focused on a small set of priority actions; and
- Offer financial support in order to encourage full participation of Indigenous groups in engagement activities.

Pertinent scientific analysis and reports developed by Fisheries and Oceans Canada should be available to all parties well in advance and presented in a clear format that links priority management actions to the supporting evidence. In addition, engagement should continue to build on work that has already been done and plan to integrate important inputs that can inform discussion, such as Canadian Science Advisory Secretariat reviews.

10.5 Region-specific Actions

Participants suggested the following regional actions that could be moved forward in the near term:

Pacific Region (Comments on the Southern Resident Killer Whale)

- Create an Interagency Working Group on contaminants. Both the United States National Oceanic and Atmospheric Administration and the British Columbia Ministry of the Environment have expressed interest in participating;
- Create a transboundary working group to support actions that address acoustic and physical disturbance and prey availability;
- Conduct a mapping and inventory exercise to help identify agencies and current initiatives and individuals already involved in recovery actions, particularly in the areas of:
  - contaminants - where capacity and infrastructure is limited with respect to monitoring and impacts on marine mammals; and
  - oil spill response – where clear protocols and timely, inclusive communication is crucial to mobilize response.
- Collaborate with the Vancouver Fraser Port Authority's ECHO program.
- Be inclusive of smaller First Nations with limited capacity, including coastal and Fraser River communities;
- Involve the following stakeholders in moving forward on priority management actions:
  - Regional and municipal representatives, including wastewater facility managers (Metro Vancouver Regional District was specifically mentioned);
  - Provincial representatives responsible for marinas and technical staff from British Columbia Ministry of Environment;
  - Infrastructure Canada;
  - Vancouver Aquarium;
  - Western Canada Marine Response Corporation (re: oil spill response);
  - United States Environmental Protection Agency, Washington's Department of Natural Resources and Department of Ecology (for any transboundary working groups);
  - Site managers for the Federal Contaminated Action Plan sites;
  - Local groups involved in protection efforts, e.g., local stream keepers groups.

Québec and Maritime Regions (Comments on the North Atlantic Right Whale)

- Develop a strong plan of action with the support of those most greatly affected, including fishers, Indigenous communities, and key groups active in waters used by North Atlantic Right Whales, to address threats of entanglement, vessel strikes, and acoustic disturbance.
- Collaborate with non-governmental organizations, universities and other government agencies to integrate existing monitoring projects into one comprehensive program for North Atlantic Right Whale monitoring in Atlantic Canada.
- Engage fishers in the conversation about possible fishery closures and other actions to reduce the threat of entanglement, using plain language that clearly identifies the processes behind the science recommendations that informs management decisions.
- Engage Indigenous groups, fishers, the commercial fishing industry, and universities in testing new gear modifications.
- Conduct engagement and further analysis to support the development of proposals to the International Maritime Organization to:
    - Amend commercial shipping lanes in the Grand Manan Basin critical habitat;
    - Amend current Areas to Be Avoided by vessels in the Roseway Basin critical habitat from recommended to mandatory.
- In collaboration with partners, increase communication with vessel operators (commercial ships; fishing, enforcement, and military vessels) transiting the Areas to be Avoided in the Roseway Basin critical habitat to increase compliance with current recommendations;
- Work with partners to enhance response to whale entanglement, and extend coverage to the Gulf of St. Lawrence, Québec and Atlantic waters.

Québec Region (Comments on the St. Lawrence Estuary Beluga)

- Take into account the industry feedback already provided to the Government of Canada on the economic, practical and operational impacts of priority management actions (as part of consultations in 2016 and 2017 to develop a multi-species action plan to reduce the impact of underwater noise, including on the St. Lawrence Estuary Beluga population);[56]

[56] As part of *Species at Risk Act* consultations.

- Work within existing structures and agreements with the province of Québec's Ministry of Transportation to build on the work of established multi-stakeholder groups on reducing the threats of underwater noise and vessel strikes to the St. Lawrence Estuary Beluga population.

In conclusion, strong commitment and collaboration are required to reduce the threats to each of the three endangered whale populations and support recovery. The way forward is emerging through research and engagement but concrete actions must be implemented to support recovery of these populations.

11. Appendices

Appendix A: Who We Heard From

Appendix A1. Summary of Targeted Engagement Session Participation					
Focus[57]	**Date**	**Location**	**In person**	**Webinar**	**Total**
North Atlantic Right Whale					
Engagement with Indigenous Groups on the threats of entanglement, vessel strikes, vessel presence and noise disturbance	June 28	Dartmouth	2	6	8
Vessel Strikes and Other Threats	June 28	Webinar only	0	20	20
Entanglement (English)	June 29	Webinar only	0	20	20
Entanglement[58] (French)	June 29	Webinar only	0	0	0
		TOTAL	**2**	**46**	48
North Atlantic Right Whale and St. Lawrence Estuary Beluga					
Multi-threat engagement with the Province of Québec	June 20	Québec	7	0	7
Multi-threat engagement with Indigenous Groups	June 22	Québec	0	9	9
		TOTAL	**7**	**9**	**16**
St. Lawrence Estuary Beluga					
Noise	June 21	Québec	18	0	18
		TOTAL	**18**	**0**	**18**

[57] Unless otherwise specified, engagement was with multiple stakeholder groups.
[58] Session planned but cancelled due to no participants on the line.

Southern Resident Killer Whale					
Contaminants	June 15	Vancouver	10	15	25
Noise	June 15	Vancouver	22	19	41
Food	June 20	Webinar only	0	23	23
Multi-threat feedback from Indigenous Groups	June 26	Vancouver	7	4	11
		TOTAL	**39**	**61**	**100**
TOTAL PARTICIPANTS – ALL TARGETED ENGAGEMENT SESSIONS			**65**	**116**	**182**

Appendix A2.1 Organizations in Attendance at Targeted Engagement Sessions where Priority Actions for the North Atlantic Right Whale were Discussed

Indigenous Group	Industry/Business	ENGO/Not-for-profit	Other Government Department	Provincial/ Municipal	Academia / research group	U.S. Government
• Maritime Aboriginal Peoples Council • Kwilmu'kw Maw-klusuaqn Negotiation Office • Unama'ki Institute of Natural Resources • Nunatukavut • Passamaquoddy • Association de gestion halieutique autochtone Mi'kmaq et Malécite (AGHAMM) • Secrétariat Mi'gmawei Mawiomi • Mashteuiatsh • Institut de développement durable des Premières Nations du Québec et du Labrador (IDDPNQL) • Agence Mamu Innu Kaikusseth (AMIK) • Essipit • First Nations Finance Authority	• Grand Manan Fishermen's Association • Groundfish Enterprise Allocation Council • Coldwater Lobster Association • Fundy North Fishermen's Association • New England Aquarium • JASCO Applied Sciences • Canada-NS Offshore Petroleum Board • Shipping Federation of Canada • Armateurs du St. Laurent • Office des pêcheurs de crevette de la ville de Gaspé	• Campobello Whale Rescue Team • Conservation Council of NB • WWF • Mingan Island Cetecean Study (MICS)	• Canadian Wildlife Federation • Transport Canada • MARLANT Safety and Environment (Department of National Defence)	• NB Department of Agriculture, Aquaculture and Fisheries • NL Department of Fisheries and Land Resources • NS Department of Energy • Office des pêcheurs de crevettes de la Ville de Gaspé • QC Ministère de l'Agriculture, Des Pêcheries et de l'Alimentation • QC Ministère des Forets, de la Faune and des Parcs • QC Ministère de Développement durable, de l'Environnement et de la Lutte contre les changements climatiques • QC Ministère des Transports, de la Mobilité durable et de l'Électrification des Transports • Secrétariat aux affaires maritimes	• Canadian Whale Institute • Dalhousie University (MEOPAR Whale Research) • St. Mary's University	• NOAA Protected Species Branch

Appendix A2.2 Organizations in Attendance at Targeted Engagement Sessions where Priority Actions for the Southern Resident Killer Whale were Discussed

Indigenous Group	Industry/Business	ENGO/Not-for-profit	Other Government Department	Provincial/ Municipal	Academia / research group	U.S. Government
• Huu-ay-aht First Nation • First Nations Summit • Tsleil-Waututh Nation • Metis Nation of BC • Cowichan Tribes • A-Tlegay Fisheries Society • Sechelt First Nations • Nicola Tribal Association • Lower Fraser Fisheries Alliance • Musqueam Indian Band	• British Columbia Chamber of Shipping • Port of Vancouver • Trans Mountain Expansion Project (Stantec) • BC Ferries • BC Pilots • BC Council of Yacht Clubs • Boating BC • Canadian Ferry Operators Association • China Ocean Shipping (Group) Company known as COSCO • Pacific Pilotage Authority Canada • Cruise Lines International • CSI International • Fraser River Pile and Dredge • Hemmera • JASCO • Northwest Seaport Alliance • Seaspan • SRMU Consulting • Vancouver Aquarium • Western Shipping • Sport Fisheries Advisory Board • SMH Consulting • Pacific Eco-Tech	• Georgia Strait Alliance • South Vancouver Island Anglers Coalition • Natural Resources Defense Council • Oceans Networks Canada • World Wildlife Fund- Canada • David Suzuki Foundation • Raincoast Conservation	• Environment and Climate Change Canada • Health Canada • Department of National Defence • Transport Canada	• British Columbia – Ministry of Transportation and Infrastructure • British Columbia – Ministry of Environment • British Columbia – Min. of Transportation • Capital Regional District • Province of British Columbia— Ministry of Agriculture		• NOAA Fisheries

Appendix A2.3 Organizations in Attendance at Targeted Engagement Sessions where Priority Actions for the St. Lawrence Estuary Beluga were Discussed						
Indigenous Group	**Industry/Business**	**ENGO/Not-for-profit**	**Other Government Department**	**Provincial/Municipal**	**Academia / research group**	**U.S. Government**
• Association de gestion halieutique autochtone Mi'kmaq et Malécite (AGHAMM) • Secrèterait Mi'gmawei Mawiomi • Mashteuiatsh • Institut de développement durable des Premières Nations du Québec et du Labrador (IDDPNQL) • Agence Mamu Innu Kaikusseth (AMIK) • Essipit • Maritime Aboriginal Peoples Council • Kwilmu'kw Maw-klusuaqn Negotiation Office • Unama'ki Institute of Natural Resources • Nunatukavut • Passamaquoddy	• Société Duvetnor • Corporation des pilotes du Bas St.-Laurent • Fédération maritime du Canada • Administration portuaire du Saguenay • Société des traversiers du Québec • Innovation maritime	• Nature Québec • WWF—Canada • Alliance verte • Meriscope • Group for Research and Education on Marine Mammals (GREMM)	• Transport Canada • Parcs Canada • Parc Marin Saguenay – St.-Laurent	• QC Ministère de l'Agriculture, Des Pêcheries et de l'Alimentation • QC Ministère des Forets, de la Faune and des Parcs • QC Ministère de Développement durable, de l'Environnement et de la Lutte contre les changements climatiques • QC Ministère des Transports, de la Mobilité durable et de l'Électrification des Transports • Secrétariat aux affaires maritimes		

Appendix A3. List of Governments, Indigenous Groups, and Other Stakeholders who Provided Written Comments as follow-up to Targeted Engagement Sessions (by whale population)			
Group	**Commented on North Atlantic Right Whale**	**Commented on St. Lawrence Estuary Beluga**	**Commented on Southern Resident Killer Whale**
Governments		• Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec • Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques • Ministère des Forêts, de la Faune et des Parcs • Parc Marin Saguenay - St-Laurent • Secrétariat aux affaires maritimes	• Pacific Salmon Commission (United States and Canada)[59]
Indigenous Groups	• Maritime Aboriginal Peoples Council	• Bureau du Ninonwentisio, Nation huronne-wendat	
Environmental Non-Governmental and Not-for Profit Organizations	• Canadian Parks and Wilderness Society • Canadian Wildlife Federation • David Suzuki Foundation • West Coast Environmental Law Association • Whale and Dolphin Conservation and The Humane Society of the United States	• Canadian Parks and Wilderness Society • Canadian Wildlife Federation • David Suzuki Foundation • Mériscope • Nature Québec • West Coast Environmental Law Association	• Canadian Parks and Wilderness Society • Canadian Wildlife Federation • David Suzuki Foundation • Georgia Strait Alliance • Orca Salmon Alliance • World Wildlife Fund • West Coast Environmental Law Association
Industry/Business	• Armateurs du St.-Laurent • Canadian Ferry Association • Hospitality Newfoundland and Labrador • Shipping Federation of Canada	• Armateurs du St.-Laurent • Croisières AML • Shipping Federation of Canada • Société de développement économique du St.-Laurent	• British Columbia Chamber of Shipping • Port of Vancouver • Shipping Federation of Canada • Trans Mountain Expansion Project (Kinder Morgan Canada)

[59] Multi-lateral governance organization including US federal and some state governments.

Appendix A3. List of Governments, Indigenous Groups, and Other Stakeholders who Provided Written Comments as follow-up to Targeted Engagement Sessions (by whale population)			
Group	**Commented on North Atlantic Right Whale**	**Commented on St. Lawrence Estuary Beluga**	**Commented on Southern Resident Killer Whale**
Industry/Business		• Joint letter: o Alliance verte o Armateurs du St.-Laurent o Chambre de commerce maritime o Corporation des Pilotes du St-Laurent Central o Fédération maritime du Canada o Innovation maritime o Société de développement économique du St.-Laurent	• Vancouver Aquarium
Academia/Research Group	• Canadian Whale Institute • Mingan Island Cetecean Study (MICS)		
Total	**31 written submissions**		

Appendix B. Profile of Respondents – Let's Talk Whales Online Engagement

Registrations by Province

Province	Count	Percentage
Alberta	42	5%
British Columbia	269	30%
Manitoba	17	2%
New Brunswick	25	3%
Newfoundland and Labrador	7	1%
Nova Scotia	49	5%
Ontario	214	24%
Prince Edward Island	5	1%
Québec	151	17%
Saskatchewan	8	1%
Undisclosed	106	12%
Total	**893**	**100%**

Registrations by Type of Participants (Self-identified)

Group	Count	Percentage
Academia or think tank	28	3%
Business or industry organization: Manufacturing	3	<1%
Business or industry organization: Natural resources	6	1%
Business or industry organization: Other	12	1%
Business or industry organization: Services	10	1%
Business or industry organization: Tourism or entertainment	13	1%
Business or industry organization: Transportation	6	1%
Environmental non-governmental organization	53	6%
General public	524	59%
Government organization: Federal	66	7%
Government organization: Municipal	2	<1%
Government organization: Provincial / Territorial	9	1%
Indigenous Peoples or Organization	11	1%
Youth (less than 25 years of age)	37	4%
Other organization	33	4%
Undisclosed	80	9%
Total	**893**	**100%**

Appendix C: Engagement Questions

In Person/Webinar Meetings

1. Do you have any further questions about the background information that was just presented or about the materials you were provided before the meeting that need to be answered before being able to participate in the workshop?
2. In reviewing the science review priorities, are there any that you believe you are already advancing? Those that could be initiated relatively easily? And which ones would be more difficult and not yet underway?
3. Based on the previous discussion, we identified science review priorities as having the potential to be relatively easy to implement. What do we need to do to implement these?
4. Some of the science review priorities will require long-term planning and commitment. In order to be successful, we will need to work together over the long-term. What are the initial steps that could be taken now to promote their successful implementation?
5. What role do you see for yourself or your organization in implementing each science review priority? [Leader – you can do a lot of the implementation of this priority; Helper – you can support some of this priority; Observer – you cannot directly support this priority, but are an observer.]
6. How do we best work together in the near future to continue with the actions required to address this threat to the species? We would like to receive your input on your preferred format for ongoing engagement and collaboration.
7. Are there other stakeholders or partners that you believe we need to include in the process who are not around the table today?

Let's Talk Whales Online Public Engagement: Questionnaires

Food availability

Improving food availability could mean keeping vessels out of certain areas where prey is found, so there is less interference with whales and their prey species. It could also mean reducing the amount of fish that humans are allowed to catch per year, which could decrease supply and increase cost in the marketplace, and/or restricting the use of habitat for important whale prey species. This complex food web requires managing the ecosystem as a whole. Here are some actions identified by scientists (generalized and in no particular order). Please rank these actions in order of how important you feel these actions are to help the whales.

> Option 1: Make it easier for certain types of whales to find and catch fish through quieter oceans.

Option 2: Reduce competition with commercial and recreational fisheries (for the prey species the whales rely on).

Option 3: Protect and preserve the habitat of important whale prey species.

Option 4: Ensure that the prey that the whales rely on have enough prey to eat themselves.

Underwater Noise

Here are some actions identified by scientists to help address the threat of underwater noise (generalized and in no particular order): Increase the minimum distance that is allowed between vessels and whales, modify vessels so that they emit less noise, change how and where vessel traffic moves (e.g. routes; speed) and create areas in important whale habitat where noise disturbance is restricted or excluded (sanctuaries). What are your thoughts on these actions?

Vessels

Here are some actions identified by scientists to help address the threat of vessel strikes and vessel presence (generalized and in no particular order): educate vessel operators on collision risks, change how and where vessel traffic moves (e.g. routes; speed), create areas in important whale habitat where vessel presence is restricted or excluded (sanctuaries) and increase the minimum distance that is allowed between vessels and whales. What are your thoughts on these actions?

Contaminants

Here are some actions identified by scientists to help address the threat of contaminants (generalized and in no particular order): Reduce the amount and number of contaminants entering whale habitat; raise awareness about what contaminants are harming whales and where they come from; cleanup sites that are already contaminated, on land and in water; take whales into account in chemical spill response and monitoring; and clean up wastewater effluent. What are your thoughts on these actions?

Entanglements (not identified as significant threat to Southern Resident Killer Whales)

Here are some actions identified by scientists to help address the threat of entanglements (generalized and in no particular order): remove fishing gear from areas highly used by whales when whales are present; modify fishing gear to reduce entanglement risk; and have an effective network of responders to disentangle whales. What are your thoughts on these actions?

Let's Talk Whales Online Public Engagement: Ideas Forum

How can we, as Canadians, take action now to reduce impacts on at-risk whales and help their recovery?